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**THE ECONOMICS OF
PRICE
DETERMINATION**

THE ECONOMICS OF
PRICE
DETERMINATION

By
C. CLIVE SAXTON

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PREFACE

IN the approach to the problem of price-determination the broad statement of the emergence of a price by the interaction of supply and demand has given place in economic analysis to the theory of the equilibrium of the firm. Interest is now mainly in the conduct of the firm and an analysis of its actions is expected to disclose the price which it is likely to fix for its own differentiated product. If this is so then changes in the economic organization of the individual firm or group of firms operating in an industry will need periodical review as a check upon the assumptions which are made for the purpose of analysis. It is suggested that important changes have taken place in the organization of industry during the last twenty years which affect significantly some of the underlying assumptions upon which the economic analysis of price-determination is made to rest. This does not indicate that conventional methods of analysis should be discarded out of hand. The expansion of the marginal analysis, by economists whose work is mentioned in the text, was intended to be put to use in the very situation which is now being described, and it ought not lightly to be abandoned.

The aim of the present work is to put to empirical test that part of the theory of price-determination which relates to the setting of prices by a firm operating in conditions which have been described conventionally as 'imperfect competition'. It is a study of some typical situations in industry, chiefly of firms known to produce a significant proportion of the total output of an industry or group of closely related products. It is based on first-hand evidence of pre-war practice, and is intended to explain the methods adopted by such firms to estimate the demand for their products and to control costs. The higher strategy of business and the entrepreneur's price policy are discussed in some detail.

An analysis of the practical steps involved in the setting of prices by a firm under varying 'market' or other conditions is made, and this is used as a new starting point to test and check the conventional assumptions of the marginal

analysis of the equilibrium of the firm. Modifications are suggested which it is submitted are desirable and indeed necessary to fit the facts disclosed.

When the text had been drafted it was thought desirable to obtain some additional support on points significant for economic theory by drawing on a wider field. A form of questionnaire was prepared and submitted to entrepreneurs—it is reproduced in App. III. with an analysis of the answers to those questions which lend themselves readily to arithmetical computation. In general the answers afford a useful addition to the observations made directly. It should be clear that the text is in no sense written round nor dependent upon the answers to this questionnaire. A questionnaire is of value only in confirmation of other evidence we may have—it cannot take the place of first-hand observation. Unless we know the patterns under which the answers to the questions are likely to fall it is impossible to interpret properly answers given to most economic inquiries.

Economists who wish to read at once the sections of most significance for economic theory may turn with advantage to Chapters VI, VIII, and IX. The other Chapters of the book are written with the minimum use of specialized theoretical terminology, and on that account should appeal to those industrialists and others who have mainly a practical interest in price-fixing.

Acknowledgment is here accorded to those industrialists who supplied me with much useful information and to those who answered the printed questionnaire. Given a continuance of such practical interest in economic research the outlook for future empirical studies is distinctly encouraging.

C. C. S.

OXFORD.

31 December 1941.

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INTRODUCTION

ECONOMIC analysis used to proceed on the assumption that conditions of perfect or pure competition represented the typical situation in industry. Whether this was a mere simplification of the problem to enable it to be subjected to analysis,¹ or whether it was a generalization from observed facts, the assumption has been questioned from time to time as it did not seem in accord with the current economic organization of the firm. But it is only in recent years that economic theorists have come to regard pure or perfect competition as a limiting case with pure monopoly at the other extreme. Between the two extremes lie all the patterns of actual business conduct which may be covered by the general term 'imperfect or monopolistic competition'. In the analysis of a market subject to the conditions of perfect or pure competition, we may neglect the actions of individual buyers and sellers, because no individual or group of individuals has sufficient influence upon the price or volume of output to affect either significantly. But if some individual or group of individuals has some control of, or influence upon the price at which the product is sold because of differentiation of the product or otherwise, then the actions of those individuals are of the greatest significance.

Attention has been focused, therefore, upon the price-fixing by an individual firm in a situation conventionally described as imperfect or monopolistic competition.² The firm is assumed to have control of its own volume of output of a differentiated product, and to be in a position (or rather have the power which it may or may not use) to fix or influence by its own actions the price of its product. The demand curve for the individual firm's product is downward sloping to reflect the fact that the more output it attempts to sell the lower must be the price at which it is offered. Changes in the price of the individual firm's product are assumed not to affect the price policy of other firms in the industry because there are so many such firms that each one will be but little affected (if at all) by the change in the price

¹ Alfred Marshall, *Principles*, bk. V, chap. i-v.

² Joan Robinson, *Imperfect Competition*; E. H. Chamberlin, *Monopolistic Competition*.

policy of any one of them. To maximize profits the firm will attempt to produce and sell just that amount of output the marginal cost of which is equal to the marginal revenue.

The theory appears perfectly clear and straightforward so long as the number of firms in active competition in respect of the sale of one of the particular group of products amongst which substitution is usual or feasible, is such that the actions of any one of them have only a widely diffused effect and do not impinge directly on any particular one or a few of the firms in the industry.

For some time it has been evident that the concentration of the production of some groups of products in the hands of a very few firms, has given rise to a situation in which the price and output policy of an individual firm in that industry may possibly have a serious effect on the output and price policy of one or more of the firms in the group.

To meet this situation writers on imperfect competition usually submit that 'the demand curve for the individual firm may be considered to show the full effect upon the sales of that firm which results from any change in the price which it charges, whether it causes a change in the prices charged by the others or not. It is not to our purpose to consider the question in detail.'¹

This simplification of the analysis only serves to beg the question. The very influences which we would like to isolate and examine are assumed to be already known and allowed for in the demand curve. If a number of firms in an industry do in fact set the price of their respective products and take account when selling that product, of the expected reactions of their several close rivals, then it would be important to know the principles which they adopt and their effect on the price which is actually fixed.

Several attempts have been made recently to reformulate the doctrines of imperfect and monopolistic competition.² The situation of an individual producer has been defined by reference to his consciousness or otherwise of his rivals' reactions to his own price and output policy.

Three typical situations have been distinguished where a

¹ Robinson, *op. cit.*, p. 21.

² 'A Review of Monopolistic and Imperfect Competition Theories', *Amer. Econ. Rev.*, 1936, p. 637.

seller is (or must be by the nature of the case) conscious of his rivals' reactions and allows for their effects in formulating his price and output policy. They are the cases of (a) duopoly, (b) oligopoly with differentiated products, (c) oligopoly with standardized products.

There are also three typical productive situations when a seller is heedless of his rivals' reactions: (a) monopoly, (b) competition with differentiated products, i.e. monopolistic competition, and (c) competition with standardized products (pure competition).

This classification seems to suggest that the categories described are each intended to represent the situation in an industry and to be mutually exclusive. This assumption may or may not be correct, but it is thought that, for example, an industry may comprise within itself an oligopolistic group and also a number of smaller firms in monopolistic competition.

The main discussion of price and equilibrium theory is now likely to centre around the distinguishing characteristics of oligopoly with differentiated products and monopolistic competition with differentiated products.¹ The problems set by duopoly are mainly academic and not sufficiently typical of an industrial situation to be of practical importance. Monopoly is rare, if it exists at all, and perfect and pure competition if approached in practice have been well covered by theoretical analysis and can be discussed in the conventional terms. There is general agreement that product differentiation is an established fact and that situations are arising in which one or a very few firms have by their individual actions a significant effect on the price of the 'group' of products made and sold by the respective firms.

The difficulty is to determine the appropriate form of analysis in respect of oligopoly, as the conventional analysis of imperfect competition does not fit the facts without straining the concept of a determinate demand curve for a firm's product.

The actual situation cannot in fact be indeterminate; even if it is difficult to cast the actual methods adopted by entrepreneurs into precise theory capable of simple analysis.

¹ 'Monopoly in Particular—Equilibrium and in General—Equilibrium Economics', *Econometrica*, April 1941, Vol. 9, No. 2, p. 121.

Superficially the firms in some industrial groups seem to be able to fix their respective prices in such manner that there are not observable changes in the output and price-policy of the respective firms. It seems that the only approach to the problem is to begin by examining the conduct of an individual firm to discover the methods adopted in practice.

This approach seems all the more necessary since doubts have recently been cast upon the general applicability of the marginal analysis itself.¹ This is much more serious for current theory than the indeterminateness of the demand curve in an oligopolistic situation, for it would strike at the very essence of equilibrium theory. If the marginal analysis is founded on error, then all the refinements of the theory of imperfect competition fail—they all require that equilibrium should be assured at that scale of output the marginal cost of which is equal to the marginal revenue. A beginning will, therefore, be made by considering the marginal analysis as it stood before doubts were cast upon its general applicability.

It may be well to set out the assumptions which are necessary for the equilibrium of the firm operating, as conventionally described, under conditions of imperfect competition.

- (1) The aim of the producer is the maximization of profits in the given situation in which he finds himself.
- (2) That the producer has perfect knowledge of the demand curve for his product and his own cost curve; from the former the marginal revenue and from the latter the marginal cost curve can be drawn.
- (3) That the cost and demand curves are independent.
- (4) That over the period of time or at the time under consideration, it is actually possible for the adjustments required to maintain equilibrium to be made by the producer, so that he can equate marginal cost and marginal revenue. E.g. there must be no hindrance in the way of altering prices if there is an alteration in demand or in the costs of raw material or wages rates, that is, if there are alterations in marginal revenue and marginal costs.

¹ R. L. Hall and C. J. Hitch, 'Price Theory and Business Behaviour', *Oxford Econ. Papers*, No. 2.

In general it cannot be doubted that entrepreneurs do make attempts to maximize their profits by every method which is open to them, though superficially their actual conduct in any given situation may appear unlikely to achieve that aim. It may be that there are many entrepreneurs who do not calculate explicitly, and thereafter equate, marginal cost, and marginal revenue. But when their actual conduct is analysed in detail it may be found that they have sought and achieved the same result implicitly. Knowledge or otherwise by the entrepreneurs of the terms invented and used in the theory of equilibrium is not necessary to an understanding of the actual practical conditions required for maximization of profits. The theory as formally stated may be much too precise to warrant an assertion of its general applicability, but this need not necessarily lead to its abandonment. With modifications or reservations required to reflect the practical aspect of business organization, it may still be a most useful instrument of economic analysis.

There is no question that on a strict interpretation of the above assumptions¹ those numbered (2) and (4) would fail in practice, and there may be some doubt about (3). The practical affairs of business are such that they are not capable of being arranged in such a way that they fall strictly within the assumptions set out above. It is not possible in practice for an entrepreneur to assess the demand for his product with more than a fair degree of approximation. The calculation of cost is only approximate and in most cases some arbitrariness is necessarily involved in its computation. In many industries contracts and arrangements may be customary or usual, which may prevent a producer from making the adjustments required to maintain equilibrium. But as economic theory cannot under any circumstances be expected to take care of every particular case, it can hardly be expected that entrepreneurs' conduct will be as strict as a theory which only purports to present the general case. The equilibrium analysis may best be regarded as an ideal state of affairs after which entrepreneurs are striving but which

¹ These assumptions are general and apply to all the forms or patterns the analysis of imperfect competition has yet taken. Cf. F. Machlup, 'A Classification of the Theories of Monopolistic Competition', *Amer. Econ. Rev.*, 1937, p. 445.

they are not likely to reach in practice. Subject to some reservations it is possible that with the dissemination of knowledge and improvement in office organization, a closer approximation to the ideal state of affairs may now be in process of being reached.

In applying economic theory to practice there does not seem to be any objection to taking the assumptions mentioned above 'in the large' or interpreting them broadly. For example, even in considering the concept of average revenue from which the marginal revenue curve is drawn, the selling price of the product would have to be averaged over some period significant for the entrepreneur's decisions. To take the price and conditions at any point of time would be of little value. Similarly, costs of production from which the marginal cost curve is drawn would be taken as an average over the period under discussion. For the purpose of analysis the product of a producing firm is regarded as homogeneous, i.e. the analysis in its simple form is only capable of dealing with one product at a time. In fact British industry is organized on a mixed basis and many diverse products may come from one factory in a different variety of designs and types. But it may be that without doing undue violence to the concepts the many products and the costs and prices can be averaged in some way. The production of a variety of products may in itself be a factor in the conduct of the producer by which he is enabled to make variations in the output and costs of each product. In this way he may be able to make adjustments which lead to a closer approximation to the maximization of profits. On a balancing up for a given period it is possible that taken in the large marginal cost and marginal revenue may have been equated, if computed as an average over the period by making adjustments in the manner above described. It is not to be expected that the entrepreneur will know very much about the economic concept of equilibrium nor any of the terms such as Marginal Cost, nor the method of its computation. But it may be found that when his actual conduct and his own computations of costs are examined in detail, he will have sought and may have found his most favourable position. If that were so it could then be asserted, in a general way, that the theory fits the situation.

There is one important matter of which the conventional analysis does not seem to take account. The equilibrium of the firm is assured by the equating of marginal cost and marginal revenue and presumably this refers to actual costs incurred. It is certain that in the practice of industrial production we shall find that more than one step is involved in the attempt to bring about this result. In most industries and in respect of most products it is the custom to fix prices for some long or short period ahead, over which it is not possible on account of existing contracts or convenient to change them, and also to fix prices before the actual costs of production can be ascertained by post-costing. The effect of this is that when the entrepreneur is making his decisions about the output upon which he will base his prices and spread his costs, his expectations are based upon some notional figure of costs projected into the future for the length of period under consideration.

We may, therefore, have to examine the basis upon which expectations are formed and the steps which are taken to implement them during the period under consideration. It may be that actual practice will disclose that there are two separate aspects of the problem; the first before production is commenced and the second during the period of production to ascertain in what way the entrepreneur can make adjustments during the period to bring the results into close conformity with his expectations. We may anticipate that the entrepreneur will during the period of production:

- (a) Adjust costs wherever possible so that the sum of the deviations of actual from expected costs will tend to zero;
- (b) That he will utilize contractual arrangements to ensure that actual costs of purchases of raw material will be approximately the same as those expected; and
- (c) If it is possible to influence the demand for his product he will do so by advertising or otherwise.

The Present Enquiry. To begin the investigation a search had to be made for a firm possessing adequate records which could be submitted to a long and careful examination from every possible angle. This requirement, regarded as the

most essential starting point of any enquiry into the equilibrium of the individual firm, proved for some time the most difficult to satisfy.¹ Many of the firms known personally to the writer could give valuable oral information but had insufficient records to satisfy exacting analysis. Many firms who possessed, or were thought to possess adequate records were found to be unwilling to allow them to be examined, probably from the fear that some comment upon them when published might refer too closely to their activities. This is an attitude quite common in industry and one to be respected. It can only be overcome gradually, and in the meantime the search for those willing to offer their records for examination must go on.

Firms were ultimately found who were prepared to give a large amount of information in strict confidence, and over a period of some months it was carefully analysed. The main points arising were discussed in detail with directors and other officials of companies having charge of the price policy of their firms, and tested by comparison with other firms.

It seems clear that this close examination of the detailed records of firms known to have control of a most significant proportion of the total output of the industry, and therefore, some control over prices, is of prime necessity in any discussion of the price fixing process. If we are able to examine the evidence upon which decisions are taken by the firm as to the kind and quality of product which it will produce, the output which is to be attempted and that which is achieved, the expected and actual costs of production, and how the price of the product is calculated and fixed, we are then in a position to discuss the conditions which will ensure the equilibrium of that firm. We shall be able to establish the place of that firm in the industry in which it is engaged and in addition to generalizations about the conduct of firms similarly placed, information may come to light which will enable us to generalize about the other firms in that industry.

¹ 'The only possibility for a fruitful empirical enquiry into these problems lies, I think, in the more subtle technique of analysing a series of single business decisions through close personal contact with those responsible for those decisions. We have had a paucity of that sort of investigation as I do not need to remind you.' F. Machlup, 'Theory of Monopolistic Competition', *Amer. Econ. Rev.*, 1939, p. 227.

By interrogating, orally or in writing, a sample of entrepreneurs, some of whom are producing a substantial proportion and others who are producing a small proportion or an insignificant proportion of the total output of their industry, we shall be able to ascertain the actions of dominant and subordinate firms and compare them.

Upon the business practice discovered by the detailed examination of the affairs of these firms, a questionnaire was formulated to test the general applicability of the methods described. It was circulated amongst all sizes of firms in nearly all British industries where it was expected that producers would have some influence over price. The pattern under which the answers were expected to fall was printed under each question in an endeavour to obtain some uniformity of answer and to make it easier for a firm to complete the form in a reasonable time. These patterns were generalizations from business experience and were discussed with many entrepreneurs before being finally settled.

The support given by the answers to the questionnaire, is indicated under each section, and generally by an analysis of replies (see Appendix III). The sample replies are not as numerous as might have been wished, but as they cover a wide range of industries it is not anticipated that any larger sample would vitiate the conclusions except perhaps in small minor details which are of little significance. The form has been completed by many important firms, and a very large number have expressed their interest in and desire to support research of this kind. Many have offered to fill up 'practical' questionnaires and furnish information when the war is over and they recommence their normal peacetime activities.

It is clear from the comments of entrepreneurs upon questionnaires generally, that there is little possibility of drawing up a form of questionnaire which will apply to all and every business or industry without many modifications,¹ but it is possible that the modifications can be effected in the pattern of the answers rather than in the actual questions themselves, and this was attempted in the present questionnaire.

¹ As to the limitations of some of the types of questionnaire which have been used, cf. article by Machlup referred to on p. 8.

GENERAL SURVEY OF PRICE-FIXING

General Conditions of British Industry. It seems certain that before attempting to analyse the business conduct of the individual firm, it will be necessary to know a good deal about the structure of the industry in which the firm is operating. In particular, it is necessary to know whether there are many firms or only a few occupied in making and selling the particular product in question, and their relative scales of output.

As far as Great Britain is concerned until quite recently we could have asserted with some assurance that in almost any British industry a fair number of firms were operating, and that in very few industries were there only one or two firms who alone or upon reaching some understanding between themselves, could affect significantly the total output of the industry. But at the present time we shall have to take each industry separately and examine the affairs of several firms who are known to have a very large output compared with some of the smaller members of that industry, before we can assert either that they have or have not the power to influence prices significantly by some change in their output or price policy. The movement towards amalgamation and concentration has now gone some way in many industries,¹ more particularly in those industries making some of the newer products or using new productive methods and expensive technical equipment for manufacturing products on a large scale.

We find that in many industries small scale operation still persists with a large number of firms all producing a product which is not homogeneous but which may be regarded for many purposes as similar in most respects.² This situation seems to obtain in general in the older industries such as the woollen and worsted industries where there appears to be little advantage to be gained by the adoption of large scale or mass production methods.

¹ Concentration in industry proceeded earlier and more rapidly and affected more industries in the U.S.A. than in Great Britain. Cf. Burns, *Decline of Competition*, pp. 8 et seq.

² See App. III, Q.4.

We do not find in British industry many firms who concentrate their entire resources on the production of one type of product only. Sometimes there are surprising combinations of different products¹ manufactured in one factory. These products, in the hands of final consumers, may be put to widely differing uses. In some cases the factory processes may be separate and distinct or they may overlap at certain points, or all products may undergo the same processes up to a point from which they then diverge. Some of these products coming from the same factory may be consumer goods or capital goods in the hands of final buyers, or they may be subject to fluctuations in demand in the same or in opposite directions.

There is the added difficulty of defining an industry. There is some overlapping as many firms are engaged in activities covered by several distinct industries, if narrowly defined by the use to which the product is put. In Great Britain there is little really large scale standardized mass-production, perhaps because the home market is not wide enough to call forth its development. Changes of taste and fashion are fairly rapid in some industries, and in others where standardization would be possible the consumers appear to prefer a non-standardized or individual product, however slight the difference may be. Many concerns which manufacture on a large scale have to provide for many patterns and designs and in some instances the number required is remarkable and entails interruptions in the flow of products through the factory.

A good deal has been written about the differentiation of products² and the advantage which such differentiation offers to a seller of that product. I am not aware that any clear distinction has been made between the differentiated product as a product suitable for certain uses and the goodwill attached to the name of the firm which produces it. Although it is certain that rational consumer preference expressed by buyers, helps to build up goodwill which is proof against the competition of similar products at slightly different prices, a certain percentage difference in price may

¹ Many firms say that they make 'hundreds' or 'several hundreds' or 'over a thousand' different types or patterns.

² As to differentiation of products see Chamberlin, *op. cit.*, chap. iv, p. 56 (2 ed.).

cause a large shift in consumers' tastes. The great majority of products forming a group of things put to similar uses supposedly differentiated have a high elasticity of substitution one for another, e.g. popular cars, boots, clothing, paint, paper, patent foods, &c.

These observed characteristics of some British industries may have an important bearing on the price policy of some of the firms.¹ Among all the features of industry it would be difficult to determine one which is the more common or typical and regard that as the general case for all firms in all industries. It is more satisfactory to examine each industry separately, and for price-fixing policy significant conduct may be discovered to explain the actions of some and may be all of the firms in an industry. But the same explanation will not necessarily fit, nor can it be expected to fit the situation in any industry chosen at random. But we may be able to assign patterns of conduct or price-fixing methods to separate industries as we do to firms, when we know their characteristics as industries.

How Prices are Fixed. It became evident quite early in the enquiry that before significant questions can be asked of entrepreneurs it is essential to know the general way in which, in practice, prices are fixed or quoted.

In each industry there are customary arrangements or methods by which prices are arranged between buyers and sellers, or are quoted. It is possible that from an investigation of these methods or arrangements of bringing buyers and sellers together, we may be able to discover whether or not in that industry some one or more firms are in a position to influence the price.

1. *Exchanges and Marts.* The firms engaged in some industries sell their products almost exclusively on national or international exchanges, marts, commodity markets, or through organizations for quoting an average daily or periodical price or list of bargains made between members. Dependent upon the speed of communications and the arrangements made for disseminating knowledge, changes in prices are known to all buyers and sellers very quickly after they take place. The price quoted at any particular time is

¹ See App. III, Qq. 6-7.

not always regarded by producers in that industry as a unique price ; it represents the average, middle, or approximate price for bargains made during the period in question. Not all the firms who make the products sold through these channels have representatives upon the exchanges or attend there on market days. But if non-member firms are making a quotation for such products the price cannot differ significantly from the quoted price. In general, slight differences would only be possible in cases of special arrangements regarding delivery dates, which is perhaps one of the most important elements in business transactions.

It is obvious that manufacturers of products sold in this way are rarely in a position to affect the price significantly by their own actions. For most firms there is no competition as regards price, but as the answers to the questionnaire will show, that does not mean that the conditions of pure competition (as outlined by Chamberlin) apply to them. They are not in a position to sell as much output as they like at or about the going price. It is still necessary for them to find buyers for their products, and this search after buyers is the element in competition regarded as of most importance by entrepreneurs. If we were describing the situation in conventional terms it would be best called 'near' perfect competition or quasi-automatic regulation of supply and demand.

The stress which is laid in the conventional analysis (amongst the prerequisites of perfect competition) on the fact that the seller can sell as much as he likes at the going price, seems to be very far from the realities of actual business practice. It is rather curious that the main aspect of competition, that is the search after buyers, which is of the utmost importance, should not find a special place in the theory. Although the price is fixed in an automatic or semi-automatic way which is beyond the control of any one buyer or group of buyers and sellers, in practice competition only begins after this price has been fixed ; that is when a seller wishes to dispose of his output and has to search for orders from buyers willing to take it. It is this striving for orders amongst producers which is competition, in that success or otherwise influences output, and not so much the fixing of the price. The automatic fixing of the price does

not, in itself, also effect the distribution of output amongst the competing firms.

Of course, we are aware that upon the base price, fixed in the way above mentioned, differences are imposed, and buyer and seller have still got to make their own separate bargains each with the other. Considerations about time of delivery and total size of the order are of importance, and these in themselves detract from the purity or perfection of the organization or 'market' in which prices are fixed. The main feature, therefore, of the situation where the prices of products are quoted daily or at short intervals, is that there is some knowledge of the quoted prices amongst all buyers and sellers, even if this knowledge is not perfect. This is one of the most important elements which distinguishes the price-fixing process by this method from many other methods. In effect the control over price of the individual buyer or seller is at a minimum. This is mainly on account of the number of firms in the market and their knowledge of the course of prices and of total available supply and demand, is nearly approaching its maximum.—

The existence of commodity exchanges may be of importance in influencing the size of the modal firms in the industry and also the number of firms engaged therein. As we shall see in discussing other methods of price-fixing, one of the elements of uncertainty is the demand price for the product, and when prices are regulated wholly or partly on exchanges or marts a new firm coming into the industry has one part of its problem already solved. There are, of course, other and more important elements influencing the size and number of firms engaged in an industry,¹ but where the producer has to make his own assessment of prospective demand, particularly for a new product, the risks involved may be a deterrent to the entry of new firms.

2. By Firms or Groups. There are a large number of industries the products of which are not sold through the channels mentioned above. The prices of these products are thought to be susceptible to the influence either of the producer himself in respect of each separate variety of the product, or that of some or a few members of the industry acting in concert.

¹ Burns, op. cit., p. 460.

There is no system of quoted prices acting as a semi-automatic regulator of supply and demand in these industries, and it is possible that as the commodities produced by several firms may be differentiated in some marked way, that buyers prefer one over another to such an extent that they are prepared to pay a higher price for some than for other similar products. There is, therefore, a clear opening for one or more firms in any of these industries to vary their output and thereby to vary the selling price of their product. This situation will give rise to price-fixing methods which are fundamentally different from those which operate in respect of those products which are sold on organized exchanges or marts.

The actual price-fixing for products which are sold in industries where there is some control of output and prices by individual members thereof, may take one of the following forms:

3. *Trade Associations.* The aim of all Trade Associations (however defined by the promoters) seems to be the elimination of that form of competition which draws most attention to the reduction of price of the product of a particular firm below that of others making the same or a similar product. In many instances the price-fixing agreements of such an association go further and prescribe standards of quality, style, or design and attach prices to each. Additionally, it is not unusual for a Buyers' Association to be brought into existence, the members of which contract to make purchases of those products from the members of the Manufacturers' Association only. In many instances sanctions are available, such as black-listing either buyers or sellers who are proved to have broken the price-fixing arrangements. When these sanctions are put into operation no member of the buying association will purchase from a black-listed manufacturer, and no manufacturer will sell to a buyer who has been black-listed. If a sufficient number of firms in each industry and in the buying establishments accept the arrangements, then price control is virtually complete as far as the individual members are concerned. But there still remains the interests of the manufacturers and the buyers considered as groups, and there is a good deal of scope for bargaining between them about price, output, style, quality, and other matters

The ultimate results must depend very largely upon the industries and the nature of the product affected.

The method of price-fixing adopted by some price-fixing associations is to fix it at some definite figure for a season of production or a definite period of time. In some cases, and in normal conditions, no changes would be made in the prices, either upwards or downwards, however changed the conditions of manufacture and the resulting impact on costs of production. But there are cases where specific provision is made for a variation, upon one association giving notice to the other.

The manufacturers' selling price to the wholesalers is the one usually fixed, but additionally provision is often made for the fixation of wholesalers' and retailers' margins, and the actual selling price to consumers. There are obviously many variations possible and they take their form from the peculiar organization or custom of each industry.

In most cases, particularly where standards of quality or grade are introduced into the price-fixing agreement, the manufacturers' selling price is composed of some kind of average of the costs of the reporting members plus a conventional or agreed percentage of profit. This is regarded as essential where alterations in grading, style, or other standards of reference have to be made every season or at fairly frequent intervals.

4. Informal Consultation. As an alternative to the fixing of prices by means of a formal agreement between the members of a trade association, the firms operating in some industries have developed a loose and informal system of consulting with other firms about the fixing of prices or effecting changes therein. Sometimes this may take the form of one firm consulting two or three of its closest competitors about price changes which it is thought should be made for some or all of the products of that industry. The very fact of this consultation seems to be ample evidence that the output of the conferring firms, taken together, is a significant proportion of the total output of the industry. They are obviously expecting by their actions to be able to influence the price of the product by acting in concert, whereas each of them taken separately could not exert such influence against the will of the other firms. This is one of the most

difficult subjects upon which to obtain satisfactory information from many industries. We know that even if entrepreneurs themselves do not confer together about the price of any of their products, their travellers, agents, and representatives are usually in fairly close contact with each other, and it is believed that the policy of any one firm quickly becomes known to the others and may influence their decisions about changes in prices. In normal times when firms are achieving a normal output and demand seems likely to be sufficient to absorb this normal output for some time ahead, there is always a genuine reluctance on the part of manufacturers' representatives to undercut, although they like to be in a position to make special prices for introductory or large orders.

In the case of these informal arrangements amongst groups of firms, no sanctions are available against any firm which breaks the tacit agreement. Therefore, when output appears likely to fall much below normal because demand-conditions have changed, there is often a tendency for the weaker firms to move ahead of their competitors and to endeavour to keep up output by cutting prices. It is believed that in normal times all these informal arrangements may be an influential factor in the price-fixing process, but that soon after the onset of a depression their effect is lost in a general scramble to obtain orders.

Informal consultation is often developed amongst a few of the firms in a many-firm industry in which there is no obvious price leader. If price changes are possible (because of expiration of contracts) at the beginning of a new season of production, one or more firms may propose that quotations be made on an agreed basis. It is not often that informal consultation will influence prices very much unless the firms concerned produce between them a significant proportion of total output.

5. Price-fixing by Strong Firms. It has always been recognized that some firms may grow to such a size that they gain control of a substantial proportion of the current and prospective output of the products of the industry in which they are engaged. These firms are said to lead in price movements and their actions are closely watched and followed by other firms who are not strong enough to influence

output to a significant extent. This price leadership may be found in many industries¹ and the methods of price-fixing adopted by dominant firms in an industry will engage the major part of our attention in succeeding chapters. Here it may be sufficient to say that if a firm desires to use its predominant position in any industry to influence prices, and it does in fact influence the course of prices, then it becomes necessary for it to have a much wider knowledge and greater elaboration of records than other firms who are content to take the market prices as they find them, or to base their prices upon some conventional price.

6. *Price Following.* In almost every British industry there will be found in addition to one or more dominant firms, a large number of firms of small or medium size making products all closely similar and capable of being put to the same use by consumers. They are not strong enough by their control of their own output, either singly or in groups, to affect the price significantly; unless they can persuade a sufficient proportion of their number to approach the dominant firms and to enter into a formal price-fixing agreement or trade association with them, their influence on price is small, if not negligible. For these small and medium sized firms the price is almost, if not quite, beyond their control, and unless they have some markedly differentiated product to offer, its price seems almost always to be the same or a little lower than that set by the price-leaders. Their selling price generally will bear a certain relationship to the price set by the price-leaders and will vary with it.

These firms make it their business to discover the price set by the price-leaders for the same or a similar product, and when they come to fix their own price they either add or deduct a little from the base price. Where they have found that some consumers are prepared to pay a slightly higher price than that set by the price-leaders or larger firms, they certainly add on a fractional difference. But they are unable to obtain new business by taking it from their larger rivals even if they decrease their price a little. Generally the case is that to sell any output at all they have to keep their price a fraction below that of the price-leaders.

¹ Cf. Burns, op. cit., chap. iii, pp. 76 et seq.

One of the most important bargaining counters in the hands of the small firms is the dates of delivery which they can offer in respect of small additions to their normal sales. In any attempt to alter materially the scale of their normal output, the buyers requirements in respect of delivery dates may be a hindrance to their expansion, especially if the dominant firm has a margin of productive capacity in hand, and can therefore offer deliveries as certain as the small firm. In general, the prices set by the smaller firms if they differ at all will not differ significantly from the prices set by the price-leaders. If the price were set much below this figure the smaller firm would be foregoing profit which it might quite easily make, and if the price were set much higher the small firm is in danger of losing a large proportion of its business.

7. *Conventional or Charm Prices.* We find in many industries that the difficulty of discovering the price which a consumer is prepared to pay for an article, is simplified by the existence of 'conventional' or 'charm' prices.¹ Entrepreneurs say that in respect of some articles consumers have become attached to certain 'popular' prices, and that they look askance at products priced at any other figures. Conventional prices seem to be in evidence in respect of many articles of popular use, particularly in respect of small wares and shoes and clothing for women. The manufacturer is thus, in normal times, almost compelled to sell his product at that price and in deciding the profit margin must fall back on alterations of quality and adjustment of costs to meet that price. He meets any changes in cost of production in the same way. Because there are in many industries conventional or recognized percentage margins of profits for wholesalers and retailers, it is also necessary that the manufacturer should fix a price to the wholesaler in such a way that the figures lend themselves readily to the calculation of these percentages without the use of fractions other than, say, a half or a quarter of a shilling. This often applies in such instances as boots and shoes, leather goods, and small wares. Although in any industry where these conventional prices have gained a very firm hold, there would appear to be a cessation of price competition, this is not so in fact.

¹ See App. III, Q. 15.

Obviously attention is not drawn to differences in prices between the goods of various producers, but in its place there is competition amongst producers to produce goods which they can impress upon customers as having higher quality, more fashionable style, and greater utility than those of competitors ; extensive advertising programmes may be undertaken. In the last analysis, competition between producers which takes this form is very much the same as price competition.

**The Typical Situation in British Industry.* It seems essential in making approach to entrepreneurs to discuss price-fixing in practice for the investigator to have some knowledge of the background of industry upon which can be framed a working hypothesis, which can be submitted to test. To approach the subject with a completely open mind is naïve ; the right questions cannot be asked without some clear knowledge of the possible answers which can be given to them. Entrepreneurs are given to improvisation to meet rapidly the changing circumstances of production, and they require encouragement to generalize upon their experiences. Great care is required in interpreting their actions in case instances of small importance are regarded as modifying, more than they do in fact modify, the general case.

As a starting point for the present enquiry some typical situations in British industry, known by experience to exist, may be examined.

(a) In some whole industries the situation appears to be nearly approaching perfect competition, more suitably described as quasi-automatic or semi-automatic price-fixing, over which no one firm or group of firms has any control. There are a large number of firms in the industry, and no one or a small group can control a substantial proportion of the total output of the industry. Competition between firms in the industry, takes the form of offering strict compliance with delivery dates required by consumers, some slight differentiation of product, varying terms of payment, and other matters of importance, but only of importance providing also that the price does not differ

significantly from that quoted on the exchange or by other sellers.

(b) In some industries there are one or more strong firms producing a significant proportion of the total output of the industry. The dominant firm fixes on some methodical basis and announces the price of its product from time to time. The price so fixed is followed by all or most other medium or small firms in that industry for their output of similar, though not necessarily exactly the same, products.

In this situation the price-leader takes into account the possible or expected reactions of one or more rivals operating in his territory, or who sell their products in the same district or to the same class of customers.

If monopoly is defined as complete control by one firm of the output of a commodity which has no close substitutes and that the producer thereof can fix the price without allowing for the reactions of any other producer, we shall not expect to find many instances. It is a limiting case and although there may be one or two instances approaching monopoly it is thought that there are always one or more substitutes available, representing articles which can be put to a similar use although they may not be equally suitable for the purpose.

In many industries there are a few firms who produce, either alone or when taken together with other firms as a group, a significant proportion of the total output of some commodity. The product is often differentiated sharply from that produced by the other remaining large or small number of firms in that industry. A large output may be achieved by these firms and maintained by large-scale advertising programmes, to build up and preserve consumer preference. In addition, elaborate methods of salesmanship may be adopted.

In order to maintain and expand output and to earn maximum profits on normal output, the strong producer in fixing his prices makes calculations of:

- (a) His rivals' expected reactions to his own price policy;
- (b) The elasticity of substitution assumed to exist between his own and his rivals' products; and
- (c) His rivals' price policy (as far as this is known to him).

For the smaller firms in the industrial group the price when fixed by the leading firm or firms, is one which they are compelled to follow. There may be small variations, but in general the conditions for them are near perfect competition, except that they cannot sell as much as they please at or about the going price. They have to compete for sales, and to find buyers for their products they have to satisfy buyers' requirements as to:

- (a) Quality and style of product;
- (b) Delivery dates;
- (c) Arrangements for quantity discounts; and
- (d) Sometimes to advertise their product to bring it to the notice of consumers.

If these medium or small size firms offer their products at prices lower than that set by the price-leaders, the difference must be only a small fraction, otherwise they call attention to themselves and the strong or dominant firms may enter into keener price competition by adjusting discounts or similar methods. But the dominant firm often leaves the smaller ones in possession of a small part of the field, if they do not try to expand output too much or to enter into severe price competition

II

THE PRICE-FIXING FIRM

Conditions of Individual Firm Fixing Prices. The circumstances in which a firm may have the opportunity of fixing the price for its product, or which may necessitate individual price-fixing, are:

(a) In an industry where there are no exchanges, marts, or organized arrangements for quoting prices at regular periods, or for grading or standardizing the product. This situation applies to a substantial proportion of British industry, and knowledge of the selling prices of products has to be brought to the consumer either direct or through the wholesaler and retailer by the producing firm itself.

(b) One or more firms in an industry may be long established and have built up, by means of trademarks and large-scale advertising, a goodwill which in many cases will indicate a strong consumer-preference for its products.

(c) Differentiation of the product in a marked degree or the existence of patent rights.

(d) The capital strength of the firm relative to others in that industry, which may induce and enable it to assert an aggressive price policy with a view to dominating the course of prices in that industry.

(e) Where the output of the firm is a significant proportion of the total output of that industry.

(f) Resistance to the entry of new firms on account of the deepening of capital in that industry, and the necessity of a large outlay on plant for the erection of a new producing unit. In many industries there is also a high risk factor and initial difficulties of assessing the demand for new products.

(g) Lack of knowledge on the part of buyers. This may arise not only on account of the lack of organized marts, exchanges, etc., mentioned above, but also on account of the available substitutes for a product not being brought to their notice. As there may be no grading or standardization of the products of several manufacturers, the buyer may not have sufficient knowledge to assess the varying qualities of each of them.

(h) The location of producers and their proximity to or distance from consumers is also of importance in some industries.

Any or all of the above circumstances may be in evidence in any particular industry. Many of the surrounding conditions may be deliberately brought about by individual producers to provide them with the opportunity of fixing the price of their own product so that it may differ significantly from the selling price of the products of other producers. In the case of new products upon which there is no guide whatever to the price consumers are willing to pay, the producer of necessity must fix the selling price himself in the first instance, though later other producers may come into the field and set or influence the price.

Of the circumstances mentioned, control of a significant proportion of the total normal output of the industry, or of the capacity of the industry, is a necessary condition of the power to fix prices. Whether the other circumstances are necessary or sufficient will depend on the industry concerned, its organization, and that of the firms relative to each other or to the dominant firm. Differentiation of the product will generally be necessary, but not always sufficient, particularly if the firm does not control a significant proportion of the total output of the industry.

It is not generally known in what sections of industry there are firms in a dominant position relative to the other firms engaged in that industry. Nor is the proportion of total output of an industry which any one firm produces known with any degree of certainty. Many firms appear to be engaged in several distinct industries if the product is fairly narrowly defined. Sometimes we find that a firm makes almost every product which is capable of being made from one main class of raw material, e.g. rubber, which may be used for a large number of products from golf balls to motor tyres.

A detailed enquiry is required to show the situation exactly as it exists in any particular narrowly or broadly defined industry, but in a general way we know that in industries such as cotton piece goods or others such as certain grades of chemicals, where the prices are fixed mainly on exchanges or marts, or in some many-firm industries, it

will not be usual for one or a few firms to produce a significant proportion of the total output of the industry.

The opportunity to influence total output significantly in any industry is mainly in respect of finished goods ready for the use to which they are intended to be put by final consumers. There are cases where capital goods may be subject to some such control, and in a very few special cases some intermediate products.

Whatever be the circumstances which either give the opportunity to the producer to fix the price of his own product or compel him to do so, he is under the necessity not only of computing his own costs of production and deciding upon the amount of profit to be added to cost, but also of making an assessment of the demand for the product and deciding upon the output he will attempt to achieve and over which he will distribute his overhead costs.

The Basis on which Prices are Fixed. The replies to the questionnaire¹ confirm that some firms are in fact in a position, or find it necessary, to fix the price of their own product. This situation arises mainly because their output is a significant proportion of the total output of the industry and the strength of their position enables them to disregard to some extent the reactions of some or many firms engaged in that industry.² Alternatively, the non-existence of marts or produce-exchanges compels them to fix prices either on their own initiative or in conjunction with one or a few other firms. In such industries a small producer manufacturing a product similar in most respects to the general run of product in that industry, is also compelled for the same reason to fix the price of his own output, but in his case the problem is simple; he can await the announcement of the price fixed by one or more price-leaders in that industry, and use the price they fix as a standard of reference. With suitable modifications he can then fix the price of his own output to suit the circumstances of his own particular business.

For the larger firm its position relative to other firms in the industry and the proportion of the total output which it normally produces, force upon it the necessity of devising

¹ See App. III, Q. 24.

² Cf. Burns, op. cit., chap. iii, p. 76.

some methodical system upon which it can fix the prices of its products. If such a firm is making a 'new' product or proposing to effect a change in the design or style of its existing products, it has no clear indication from outside sources of the price at which a certain quantity of its own differentiated product is likely to be demanded. The other smaller or medium sized firms in the industry refrain from announcing their prices until there is some lead from the dominant firm or firms in the industry. It may even have become part of the tradition of a dominant firm that it gives a lead in the production and pricing of the group of products made in that industry. Moreover, there are many instances of the products of such a firm having attracted to themselves a certain consumer preference, and this enables those products to be sold at prices higher than the majority of other products falling within the same group or industry. A large firm, aware of such an advantage, turns such a situation to account and formulates a price policy distinct from, though forming part of, any general price policy in the industry.

There are still several industries in which the average or modal size of a firm and the number of firms engaged in the industry, is such that no one, or a few taken together, produce a significant proportion of the total output. Such a situation was probably typical of British industry until the opening of the present century. Since that date the newer industries which have become prominent have generally adopted the methods of large scale or mass-production, and the consequence is that the typical size of the business unit in those industries is large. The very fact that in respect of the new products which were then being introduced, there was little guide to price except the estimated costs of production of the new product, in itself forced upon these firms the necessity of announcing the price of their own products without awaiting indications from other firms or a market valuation.

Gradually in the case of some of the older industries, and more quickly in the case of many of the newer industries, some one or a very few firms have attained a dominant position¹ and enlarged the size of their equipment and attracted consumer-preference, so that normally they may

¹ Cf. Burns, op. cit., chap. iii, p. 76.

expect to produce and sell a significant proportion of the total output of that industry, over a given period of production. The price of the product has to be announced to consumers either by advertisements, trade catalogues, or otherwise, at given times, and to remain in operation for certain customary periods which may be very short, such as three months or so, or longer, sometimes upwards of a year.¹ In all situations where there is no organization outside the individual firm, such as an exchange, mart or a price-fixing agreement in the industry, the producer must fix and quote his price in one of the following ways:

- (a) He can announce his price to his usual customers and to others,² and whilst taking into account the reactions upon the output and price policy of one or more rivals, he can ignore the possibility that they will set their prices much below his own announced price; or
- (b) He can await the announcement of the prices set by one or more other firms and then fix his own price at a slightly higher or lower figure.

In some situations the two courses set out above, one being the contradictory of the other, cover the actual conduct of the several firms in the industry.

- (a) The very strong or dominant firm which is so circumstanced that it need not pay any regard to the reactions of the smaller firms to its own price-fixing policy, announces its prices without reference to other firms.
- (b) The other course of action describes the policy of all those small firms who are compelled to await and follow the price fixed by one or more dominant firms whose product is similar to their own.

The exact situation, as described, is found in several industries, and it is thought to be the most common or usual case of practical price-fixing methods in British industry.

¹ As to comparative rigidity of the price of some products over periods of varying length, cf. R. S. Tucker, 'Reasons for Price Rigidity', *Amer. Econ. Rev.*, 1938, p. 41; and discussion thereof by R. C. Wood, *Amer. Econ. Rev.*, 1938, p. 663.

² The fixing of prices in trade catalogues is not a sufficient reason for some entrepreneurs disliking price changes. Many firms issue catalogues showing prices which appear absurdly high, and issue a periodical list of 'trade discounts' which may be deducted from these prices. By varying this discount their selling-price is effectively altered, without the necessity of re-issuing catalogues to give effect to the changes.

There are usually two or more, but the number is always small, producers whose output taken together is a very high proportion of the total output of the industry. These very few firms may each ignore a number, small or large, of small or medium-sized firms whose output often, taken altogether, is not a substantial proportion of the total output of the industry, or of the product for which the price is fixed by these methods.

Any one of the larger firms may, by its conduct, come to be regarded as the price-leader amongst the group, or as often happens, at one time one firm will take the lead and at another time one of the other firms will assume the lead of its own volition or by arrangement. For one type or design of the product one of the larger firms may fix the price which the other firms, large and small, all follow with or without modifications, in respect of their own products. Other styles or designs or qualities of the same products may be subject to price-leadership by one or other of the large firms; and so all kinds of combinations can be built up in respect of the products of that industry. It is known that this is the usual result in some of the newer industries. ✓

But when firms recognize each other as sharing between them a high proportion of the output of a particular industry, sooner or later some kind of informal consultation between them is developed. How far this goes to promote a joint price policy it would be exceedingly difficult to say. Firms are most reticent in discussing in detail that aspect of their price policy, and it is not always possible to judge from their actions what the present state of affairs may be. At times such firms appear to be following active price competition, and sometimes for long periods their prices diverge little from a norm about which they are ranged.

It is clear that in any situation where a producer is called upon to announce his price upon his own calculations and without any guide from outside, he must try to discover at the relevant date at least the price which promises maximum profits to him over the period involved and the output he expects to achieve and sell. In a situation where the producer decides to announce his own price on his own initiative, he is obviously thrown upon his own devices for calculating the price that will be most profitable to him. Even in an

industry in which it has become usual for a dominant producer to consult with one or a few other firms, he will not be able to avoid stating his own idea of what the price should be, otherwise there is no point in the discussion, and he may as well await the decision of the one or other of the firms whose prices he can follow. Therefore, to be in a position to set the price of his product with any degree of assurance, the producer must, and in fact he does, prepare calculations in more or less elaborate form, to record his decisions and to utilize them for purposes of control.

The Budget or Output Plan. The method of control used is an adaptation of the familiar budget of central and local authorities. All or most of the elements which enter into the firm's productive activities are predetermined in advance of production and every effort is used during the period concerned to operate the factory as closely as possible to the plan set out. Responsibility is placed upon certain members of the executive staff for the fulfilment of the plan in so far as it affects their several departments of the factory. The whole scheme of operating the plant is set out in detail in a budget, or output, or production plan.¹

A budget or output plan prepared by an individual firm may range from the simplest estimate of expected cost of production over a given period conjoined with an estimate of the probable output and sales at given prices, to an elaborate review of every department of the enterprise.² There is now being applied in industry, more particularly amongst the larger firms, which includes those who are aware of their opportunity to influence output and price, a system of budgetary control combined with standard costing.

The underlying idea is to apply, with suitable modifications, the system of budgeting in advance for all the activities of the enterprise over a period or season of production, which is often a year, but it may be any longer or shorter period depending on the nature of the industry. The intention of the framers of the budget is to set up an ideal state of affairs as an end or aim to the attainment of which all the means within the power of every departmental or sectional head of the business will be directed.

¹ For specimen budget see App. I.

² See App. III, Q. 10.

Whereas in the case of a business operating without any detailed or recorded plan of action, the main objectives depend on the memory and changing views of one or more heads of the enterprise, in the case where a written budget is circulated amongst all those who have to make decisions, there is a common purpose and aim which is clearly set before each and all of them.

Neither a system of budgeting nor the relating of prices to estimated or expected costs of production may be considered to be revolutionary, or indeed novel, but the adoption of a detailed system and the setting up of cost control departments does bring into clearer perspective the whole of the price-fixing process. ✓ We know that in general there now remain, in this decade of the twentieth century, very few trades or industries the consumers of the products of which will purchase or give an order for goods on the basis that the price will be fixed after the goods are made and the cost ascertained, upon which the customer will pay the price shown on a bill to be delivered. Even in those cases, and they are becoming rare, in which a fixed price for an article or for a piece of work is not quoted until the goods are made, some rough estimate is given by the producer to indicate, within limits, what the price ultimately charged will be.

Therefore, for the purposes of economic analysis of the conduct of the individual firm which fixes prices, the most important starting point is the recognition of the fact that the only guide available to a firm when quoting a price is an estimate of the expected costs of production, and not the actual costs incurred.

The custom and practice of estimating, in itself, is sufficient to force upon the producer the necessity of keeping some records upon which, as and when required, he can prepare an estimate to be submitted to intending customers.

Some attempt at budgeting or forecasting costs was always made in advance of production. In every case where an individual firm either had in fact, or hoped by its actions to exercise some influence, however slight, over the selling price of its own product, some form of estimating or budgeting was used. It would be necessary to connect closely the

selling price with the estimated or expected costs of production if profits were to be maximized. Unless the firm can follow the 'market' or another firm's prices and disregard the prospective profit or loss to be incurred, it must have a system of 'cost control' of some kind. It seems to be almost axiomatic that any firm of whatever size, which can detect the slightest possibility of influencing prices, will always use such opportunity to exert its individual strength or power to relate prices in some way to its own costs of production. Entrepreneurs' decisions upon price policy have always been related to their expectations of the amount of output which they can achieve in a given period and the expected costs of producing it.

But with the growth of large-scale enterprise, changes in the technique of production and the methods of marketing of products, the larger firms in particular have developed a systematic review of future operations, which is formulated in a budget or output plan. Accompanying the adoption of a systematic collection and presentment of the facts relating to the business activities, there is usually a system of cost control. The details of such systems vary, as might be expected, according to the nature of the product manufactured, but the underlying idea is to set up ideal costs of performing certain operations or processes. The ideal or standard cost is used as a standard of measurement of the efficient operation of the plant or otherwise. Its formulation compels attention to deviations in either direction, which may be significant for the future operation of the plant. Additionally, the standard cost of any process is available as a guide if quotations are called for in respect of some new product, and the time taken in the estimating department is lessened because the detailed costs of each operation or process are already calculated.

It is not unusual for a firm selling its products on marts or exchanges under conditions of semi-automatic price-fixing, to use a system of budgetary control as a guide to and check upon its operations. It is not so important or necessary in these conditions. But if a firm has no extraneous guide to the price of its products it must prepare a budget or plan of production to bring together the two related problems of the determination of the expected demand for the

product and the expected costs of producing it at different scales of output.

More details of the methods of formulating the standard will appear when we come to deal with costs in detail.

Period for which Prices are Fixed. The answers to the questionnaire indicate that the procedure outlined above is usual in those sections of British industry (and the proportion is growing) in which some one or more firms set the prices of their own products mainly, though not exclusively, by reference to their own costs of production. We have seen that in many industries no one firm has control of sufficient output to be able to influence price. In other industries a few firms set prices and others follow. But the number of firms who actually fix prices is growing and their effective influence on the prices of all products within their group is very important.

The remainder of this analysis will, for the most part, refer except where otherwise mentioned, to the conduct of firms who are to be regarded as being in a strategic position in the price-fixing process.

The analysis will show at many points the methods these firms have adopted to strengthen their influence upon prices, and the structure of the industry which may either appear as a cause or effect of the policy they adopt. Many details will be introduced which will be applicable only to certain industries, though an attempt will be made to generalize where this is justified, to give an explanation of the general conduct of price-fixing firms.

At the outset we may refer to the questionnaire to explain a system, which has not yet become obvious, of fixing prices which are not subject to rapid change.¹ Whilst no one expects costs of production, taken as an average over a period of some months, to remain constant, some manufacturers take the view that consumers view frequent changes in prices with disfavour. Whether this view has arisen spontaneously from consumers or has been imposed upon them by the decisions of entrepreneurs, it is an observed fact that in respect of some products prices change less often

¹ See also Tucker, *op. cit.*

than others.¹ There has grown up in the last few years a practice amongst manufacturers, particularly where some part or the whole of the product is capable of complete or partial standardization, of making prices rigid over a period. Where this practice is adopted the manufacturers deem it necessary to indicate, and the customers wish to know, the period over which the price is to be effective. Such a situation is found, for example, in the prices attached to motor vehicles. In the case of this product designs or styles are usually changed, if at all, at or about a certain time in the year. When models and prices are fixed it is expected by consumers that the product will be on sale at that price for the succeeding year or season of production. This is a most important instance of the organization of production and selling arrangements requiring the manufacturer to formulate a definite plan of production for a period or season.

Practices of this kind are growing in British industry, and by their very nature they impose upon the producer a methodical approach to the price-fixing problem.²

There are some industries in which most of the firms have an arrangement with their customers that the prices fixed in catalogues and advertised are intended to cover some stated period, but are subject to changes on notice being given to the customer. Where arrangements of this kind are made, price changes are usually avoided by the manufacturer wherever possible, and notice of increase or decrease is only given when there are significant changes in cost of production.³

The two cases mentioned above are typical of that section of British industry in which there is found a few firms who have some influence over the price. In those industries where there is little or no control over price in the hands of any one or group of firms, the answers to the questionnaire indicate that prices can be changed at any time without notice. It is obvious that in any organized exchange or market where prices are quoted daily or periodically, any

¹ The comparative rigidity of the prices of some products in U.S.A. has been well set out (cf. Tucker op. cit.) but it does not appear to have been stressed that prices are rigid because firms fix them in such manner as a definite part of their price policy. Cf. also Burns, op. cit., chap. v.

² See App. III, Q. 20.

³ See p. 27, n. 2.

firm whether represented on the exchange or not may be under the necessity of making periodical changes in its prices for future delivery.

As the relative importance of the total annual output of the newer industries may become very much greater than that of the old or staple industries, we must take note of and distinguish sharply, the economic organization of each and its importance in the method of fixing prices.¹

One of the most significant elements in the organization of the newer industries is the season or period of production. This is of the greatest importance because entrepreneurs' plans are made to relate to this natural or artificial season of production. The expectations upon which the entrepreneur makes his decisions are formulated and crystallized into a plan or budget at a certain time in the year. As we shall observe hereafter, whilst some of these crucial decisions are plastic and can, therefore, be changed if required during the period of production, there are other important decisions which are, or tend to be, rigid and cannot be so changed. It will be obvious that in those cases, and there are many, in which the producer definitely holds himself out to maintain a fixed price for his production during a season, that all changes will have to be smoothed out within the organization of the firm itself, and cannot be passed on to consumers by altering prices.

Therefore it is important when analysing the conduct of the firm, or looking at the equilibrium of the industry as a whole, to know how long the season is, what part of a year it covers, and the dates during the year when plans are made.

Reference to some of the completed questionnaires reveals that the nature of the product often determines the length of the period and the time in the year when production plans are prepared. For example, in some sections of the shoe trade plans will be made in August to October for spring goods, and in April or May for the following autumn. There will often be a considerable time lag between the planning of the production for these seasons and the earliest

¹ 'In general, markets in which prices are stable for considerable periods are those in which there is a firm with a quasi-monopoly, a price-leader or a small number of firms.' Burns, *op. cit.*, p. 42.

dates upon which delivery can be made.¹ This may vary from one month up to six months, and sometimes more. Whatever changes there may be in costs of production, the price agreed upon in respect of all orders already taken, is fixed and unalterable. Obviously a situation of this kind imposes upon producers the necessity of making detailed plans to cover themselves against the risks of unforeseen changes.

The significance of the correct determination of the producer's period or season of production is in connection with the analysis of short and long period effects. We have ~~never~~ been able to determine the length of either period, but they have been defined in a general way.² The short period is supposed to be that length of time over which technical equipment is fixed and cannot be altered, whilst in the long period almost any and every change can be made. In reality it is found that there is less rigidity in technical equipment and conditions than in the other elements in the production plan, which are imposed on the producer by the nature of the product, and those self-imposed to give fixity to price for a period.

It will be seen more clearly when we come to deal with changes in prices, that changes in demand do not cause an alteration of selling price during a period or season of production. The conventional short period analysis concludes that the general case is that a change in demand does cause an alteration of prices in the short period. ~~But the conventional analysis applies at all, it applies only to those industries working under conditions of near perfect competition; that is, in those industries whose products are sold through exchanges or marts or under arrangements where prices are quoted daily or periodically. In those cases it is obvious that changes in demand, even if only of small magnitude, do have an immediate effect on the prices of goods for future delivery. But it is equally clear that when the price of the product is fixed for a period or season of production, any normal changes in demand do not affect the price at all. This is clearly borne out by the questionnaire.~~³

We conclude then that the relevant period for the analysis

¹ See App. III, Q. 5.

² Marshall, op. cit., bk. V, chap. v.

³ See App. III, Q. 34.

of price-fixing is the season or production period of the individual firm which we are studying. It may or may not be exactly the same for all firms in an industry, but in general it is found to be approximately the same. The length of time covered by a season or period of production is generally twelve months. Some industries have two or more 'seasons' which may overlap in respect of different products. If so, a firm makes up a budget for a period of six months and fixes its prices to cover that period of six months, which represents the season for the particular product involved.

It is also important to observe the particular months in the year when plans are normally being made. Events occurring at that time, such as an increase in demand, prospective alterations in wages rates or other costs, will enter into entrepreneurs' expectations with some force, and will form part of the budget or plan for the forthcoming period of production.

Contents of the Budget. The budget or out-let plan, as indicated above, may be a comparatively simple review of the operations of the business and a formulation of expectations of price and output for the season or period ahead, or it may be a very detailed plan covering every aspect of production and sale of the product.¹ The actual methods of preparing a budget and controlling costs will vary according to the nature of the product and the particular organization of the firm concerned. Its contents will also depend on the size of the firm and the amount of time and expense which can be given to this aspect of organization and management. It is not possible to generalize at all upon the detailed care and accuracy with which the budget is framed, particularly as not much evidence has yet been collected nor examples of budgets made available for publication. But the replies to the questionnaire indicate that the following points all receive more or less detailed attention:

- (a) An estimate of the demand during the period for the firm's product, and the price at which it is expected it can be sold.
- (b) The standard or estimated cost per unit of producing the quantity expected to be demanded.

¹ Sanders, *Cost Accounting for Control*, pp. 430 et seq.

- (c) An estimate of the normal output of which the existing plant and equipment is capable.

Additionally, some firms make estimates of the cash resources required for their programme, the effect on profits of changes in output, the possibilities of adding to their fixed equipment, the expected effect on sales of changes in prices, and advertising programmes.

Sometimes the budget may be divided into shorter periods of two or three months, and in some exceptional cases even a weekly programme may be set out. But whatever form the budget may take and however detailed it may be, the main objectives are the same. They are:

- (a) To keep the price fixed for the season or period of production, or in those cases where changes are possible, to keep it fixed except in the case of violent changes in cost.
- (b) To compare periodically over the season the actual output up to that date, or for that part of the season, with the expected output, and to devise means of forcing sales if output falls below the amount expected, or to rearrange delivery dates if demand is expanding.
- (c) To control the actual costs of all processes and operations to keep them in line with the budget costs.

III

DEMAND

General. The first item entering into a producer's budget or output plan is an estimate, formed in some way, of the demand for his products at or about certain prices.¹ The evidence upon which such an estimate is made varies considerably ; it may be compiled from carefully collected records, or from tests made, or from guesses by salesmen and others. The answers to the questionnaire suggest that many producers are under the impression that they can form a reliable estimate of the demand for their product. This is indicated in the general form of the answers to Question 47.² But very few have any certain knowledge of the elasticity of demand for their own product. Very few have attempted to give the information called for by Questions 26-8.² Many entrepreneurs have experimented from time to time by continuing their existing prices when rival firms in the industry have altered their prices, but have either not detected any effect upon their sales or have not been able to extract the information from records. We know that a large number of producers rely upon records of past sales as a basis upon which to calculate the expected sales of any product during a future period. This information is often supplemented by information and reports appearing in technical and trade journals, and by reports of travellers and agents engaged in selling that particular product. Additionally, some firms gather information from wholesalers and retailers who handle the product, and some of the larger firms organize what they describe as a field service to collect information about demand.

It is clear that entrepreneurs who use information gathered in the manner indicated above, have only a very rough guide to the amount of output of their product which is likely to be demanded over a period projected some time ahead. One of the main difficulties is to determine within some reasonable margin of error, the actual quantity of products which

¹ For a study of the demand for sugar see Schultz, *The Theory and Measurement of Demand* (Chicago, 1938).

² See App. III.

have passed into the hands of consumers during any particular period. There is no certainty that the stocks of wholesalers and retailers are constant, and fluctuations therein of any importance would have to be taken into account to determine whether or not the output from the factory during past periods, was finding its way into the hands of final consumers. To meet difficulties of this sort some of the very large firms have set up market research organizations and collect information about changes in stocks. In the food and drug trades Messrs. A. C. Nielsen & Co. Ltd., have set up an organization in this country to undertake market research on behalf of manufacturers. It is too early yet to say whether, upon information collected in this way, a near estimate of demand for any particular period can be made. For the time being each producer has to make his own estimates with the help of such information as he can gather from the sources at present available.

In framing a budget of expected sales for a period ahead, to which the output of the factory can be adjusted, entrepreneurs are undoubtedly guided, in the first instance, by the record of past sales of their products and the trend thereof. The answers to the questionnaire reveal that a large number of firms enjoy constant or steadily increasing output.¹ This cannot be taken to represent the typical condition in British industry, though it is undoubtedly the typical condition for old-established firms in certain industries. But taking each product separately, the replies show that, as we should expect, there is a steady demand for many products of British industry.

In those cases where a producer is manufacturing continuously, not necessarily a standard product, but one which does not change much year by year, the present state of his order-book is often used as an indication of future demand. If he finds at the time when he makes his crucial decisions, that his unfilled orders are much larger than in previous years, he assumes, in the absence of any contrary indications, that demand justifies his budgeting for a little more output than in previous years. Similarly, he budgets for some reduction in output if the amount of unfilled orders has fallen.

¹ See App. III, Q. 46.

But the most interesting case, and one which is now becoming fairly common, is the situation where a producer finds it either necessary or desirable to alter types, styles, and designs, every season or period of production. In such a situation a much more detailed examination of the state of demand is required at regular intervals, and the actual forecast of demand for the future calls for more enquiry and more careful estimating.

It has become obvious during the enquiry, that manufacturers of many articles in common use, divide products into classes which may be called price classes. Products falling within each of many price classes are supposed to sell only to certain roughly demarcated income groups of the community. Allowance is made for the fact that there is overlapping at the margin and that an appeal to marginal buyers is always desirable. But it is clear that many articles which are normally purchased by persons having an income of upwards of £400 per annum are not normally purchased by those having an income of less than £200 per annum. For example, those persons in the lower income groups rarely purchase shoes at 35s. 9d. per pair, and those in the higher income groups are seldom known to buy shoes at 12s. 11d. per pair.

It is, therefore, a matter regarded as of great importance to the entrepreneur, to decide into which price class his goods will enter, but of course he does not necessarily confine his activities to one or a few price classes. In some industries, however, producers have apparently found it desirable to confine the activities of any one factory to a certain range of goods falling within certain well-defined price classes. If they wish to enter goods into price classes between which there is a fairly wide gap, so that the products falling within extremes would have to be sold through entirely different wholesale or retail channels to reach the class of consumers for whom the product is intended, then separate factories are sometimes occupied, occasionally by associated or subsidiary companies. It is obvious that in these instances no practicable price concessions can bring the more expensive products within the reach of persons of the lower incomes.

The real question then which a manufacturer is compelled

to investigate is, what quality or style of product can he produce and sell within a given price class ?

The effect of products being actually divided sharply into distinct price classes is that there is no competition between producers whose goods are not in the same price class. A comparison of the experience of several firms whose products may be roughly classified as falling within the same industry, shows a remarkable difference in the number of competitors which they assume exist in their industry. For example, one firm may say that it meets with six competitors, another firm which one understands produces a similar product, states that it meets with competition from twenty firms. Yet another in the same industry may meet with competition from only three firms, and another may even be conscious of the competition of thirty firms. This is not surprising if we examine the trade catalogues of a few firms and know the quality, style, and kind of products they normally produce and sell. It is evident that some firms make goods of the same or similar nature, or at least falling under the same trade description, taken roughly, as a large number of other firms. Those who confine themselves to very narrow ranges may only feel the competition of a few other firms who specialize in the same range. It is clear that the possible points of contact are numerous, and therefore in assessing the demand there is little possibility of any producer having full information or statistics upon which to make his decision ; if he can make reasonable estimates from the reports and general information coming to him, that is the limit of his achievement in assessing the demand.

In some industries trade federations or associations collect detailed statistics from which it is possible to make a near approximation upon which a forecast of future demand can be based. For example, the details of building plans passed during any particular period, are a useful indication of the likely demand, or its trend, for all classes of building material. Upon such information a fairly reliable forecast can be made, although in the case of some products which are used in building it would be necessary to know more about the actual places in which the buildings were to be constructed and the type of materials and fittings likely to be needed. For the motor manufacturing industry the

Society of Motor Manufacturers and Traders in their Year Book give statistics which they have compiled, to show the estimated life of a motor car. From this a manufacturer can calculate the approximate number of cars which are likely to be replaced during any given period, and this will form one part of his total demand. The forecast of demand for new cars is sometimes based upon the average number of cars registered in some preceding normal period.¹ From his own figures of production the manufacturer will be able to assess roughly the proportion his output bears to the total for the industry, and the final figures of forecast demand for the future production period is completed. Of course, adjustments are made for cars imported and exported. Similar calculations are made by all those manufacturers who supply parts or semi-manufactured goods to the motor industry.

We believe that similar methods are used in calculating the probable demand for radio receivers; it is possible to make a fair estimate of the life of a radio set, and there are statistics available of the total licences in existence, and the additional licences issued each year. The figures may not be very reliable for a few years until the industry has settled down, but they do undoubtedly furnish a guide to the probable output which can be sold, assuming that the price-classes remain about the same and that there is no unforeseen event which will cause a redistribution of consumers' resources unfavourable to that industry.

To manufacturers of many other products such statistical sources are not known to be available, and if some guide can be obtained from the statistical abstracts there are a large number of manufacturers who have not yet learnt how to use them. The most compelling necessity to seek for statistics and information about demand is always felt by those manufacturers who are producing a new product of which they themselves have had no manufacturing experience. As nearly all new products are, in the first instance, manufactured on a small scale to introduce them to the public, there is after a very short time a guide within the firm's own experience, which can be used for forecasting. So it comes

¹ Society of Motor Manufacturers & Traders Year Book. 'The Motor Industry of Great Britain, 1939.'

about that beyond the firm's record of previous sales and the more or less general information coming to hand, there is in most industries no other, or at any rate no other more suitable guide to the amount of output which can be sold.

The case is, however, rather different for those firms who have decided to engage upon an aggressive price policy. When a manufacturing firm has reached a certain size, the consumers who buy goods in the price classes which the manufacturer normally reaches, cannot possibly be induced to buy a little more of it at such slightly lowered prices as appear practicable to the manufacturer. In these cases the manufacturer either remains content with the present size of his organization and profits, or seeks by experiment and research, to make a very big change in the type or style or design of the product, so that the cost of production can be cut very sharply, and the product sold at the required profit in very much enhanced quantities.¹ This seems to be the tendency in respect of many products with which we are familiar. The late Mr. Crabtree in an article wrote that the tendency seemed to him to be for manufacturers to use their ingenuity to invent a colourable imitation of products already finding a ready sale at a high price, in such wise that they were able to sell vastly increased quantities at a much lower price.² A manufacturer who adopts an aggressive price policy of this kind, usually first sets up an organization to gather information about the possibilities of selling large quantities of the product at a given price. If there is for some products a point of satiety in the price-class in which the product is usually sold, we can understand why entrepreneurs often state that the normal consumers of a product do not buy more of it in response to a small or practicable change in the selling price. This may also be one of the reasons why very few firms are prepared to make any experiments in frequent small changes of prices, to test the elasticity of demand.

Elasticity. Knowledge of such a precise concept as elasticity of demand is certainly exceptional in industry, although

¹ See Nourse and Drury, *Industrial Price Policies and Economic Progress*, pp. 41 et seq., for fall in price of refrigerators in U.S.A.

² J. A. Crabtree, *Thoughts on Business Forecasting* (Walsall, 1928).

some of the very large firms do collect statistics about certain products and occasionally make special tests of elasticity. They are in a position to engage skilled statisticians and sales promotion experts, who devise methods of breaking up the problem so that they can get some test of the response of sales to changes in prices. We have not been privileged to see any published matter which indicates the results of tests which have been made by individual firms. Many manufacturers state that they are unable to overcome the difficulty of assigning proper weight to other causes affecting the volume of sales, which may be at work at the time and over the period that the price changes are made. This will always be one of the difficulties and until we have much more experience and more details are available of the methods adopted in the sales programme, we cannot assess the value of the tests for theoretical or practical purposes.

In the questionnaire (Nos. 26-8) entrepreneurs were asked to state if they had made experiments in price changes:

- (1) By continuing their existing prices when rival producers have altered their prices.
- (2) By changing their then prices when rivals have continued their existing prices.

In some cases the reporting firm has not observed any very marked variation in sales either one way or the other, and from this we can conclude that for that particular product of that firm the change in price was not of sufficient magnitude to induce consumers to substitute one product for another. In one interesting case which, however, does not cover an important section of British industry, the firm actually recorded an increase in sales of 100 per cent during a period of three months when its price was 5 per cent lower than its competitors, and when its price during another period of three months was 10 per cent higher than competitors' prices, sales fell by 50 per cent. There are about 20 firms engaged in the industry which this firm regards as its close and active competitors, and it seems remarkable that, for the small change in price, the elasticity (roughly calculated, of course) is so high.

At the other extreme we find a very large concern holding a predominant position in its industry, consisting of about 100 firms, which can detect no marked effect when prices

are altered in one direction or the other, and they assume for pricing purposes that no marked change can be expected for any practicable alteration in prices; their sales are fairly constant over long periods.

In many industries, although it would be hazardous to generalize, changes in prices up to about 5 per cent are regarded as tending to be insignificant and to have very little, if any, influence on sales. Between 5 per cent and $7\frac{1}{2}$ per cent (increase or decrease) the producer expects a moderate response assuming that competitors do not also increase or reduce their prices. If competitors do alter their prices it is expected that the position will be very much as before and that the sales of the individual firm, and of the industry, will remain about normal. It seems that in most cases an alteration in price of something of the order of 10 per cent, assuming that competitors do not alter their prices, will have a very substantial effect on the sales of any particular firm. But it so happens that in almost any industry, under normal trading conditions, a decrease in prices of such an amount is impracticable; it would cut into the margin for profits much too deeply. An interesting case which came to my notice is worth mentioning. A firm whose records I examined, had made some rough calculations of the change in sales which would have to take place to maintain their annual profit upon a reduction in the price of the product. They decided not to make the change because their reports coming in from outside representatives led them to believe that the increase in sales which was required would not be easily reached. I worked out the figures and discovered that the firm wished to achieve a 30 per cent increase in its turnover for a 10 per cent decrease in price. This shows that they were unable to assume an elasticity of 3. Amongst the replies to the questionnaire was one from a firm engaged in the same industry, from which it appeared that on one occasion when their price was 10 per cent higher than that set by their close competitors, sales were 20 per cent lower. They also made the assumption that if their price remained at 10 per cent above their competitors' prices for some considerable time, their sales might decrease 30 per cent. This tends to show that in one or two industries, at any rate, very careful

calculation of the response of sales to changes in price is made from time to time.

Another interesting case was that of a firm which had actually maintained its prices at a figure 10 per cent lower for six months, and 10 per cent higher for another period of six months, and in each case the change in sales was 25 per cent above normal in the first period and below normal in the second period. The industry was one in which there were a large number of competitors covering the same ground and selling closely similar products. In the case where firms make machinery, tools, and similar types of capital goods, there are some striking instances of their having experimented with prices, and the result upon sales having no effect whatever. This seems to be of the utmost importance, and tends to confirm observations that in a depression however low prices of capital goods may fall, the demand cannot be stimulated merely by a cut in the price. Capital goods are either called for as an urgent matter to produce consumption goods (or other capital goods) or they are not required at all. This explains, if such explanation is needed, why the output of the capital industries fluctuates so violently, at any rate whilst we are looking at the situation from the point of view of the manufacturer of these particular types of capital goods. But in order to show how premature it would be to generalize upon the foregoing, I mention another case. A maker of capital goods was faced with the competition of about fifty firms, whereas the one mentioned above was a three-firm industry. He manufactured a rather different type of capital goods for a particular industry, and discovered that when his price was 20 per cent higher than that of his competitors, during a period of twelve months, his sales were 50 per cent lower than they were previously at the old price.

We can understand that producers find difficulty in giving a quantitative basis to all the elements in the problem of demand. Nearly all manufacturers of differentiated products take notice of, and give weight to, their representatives' reports upon the tastes, habits, and prejudices of consumers. They deem it necessary to respect customers' reactions, but where the opportunity arises they attempt to change them by skilled advertising and salesmanship.

Estimates of consumers' incomes are often made, particularly of the part of the income of certain classes which is usually spent upon that group of products into which the product of the particular firm may be deemed to fall. There is always discussion upon the budget by the executives of the business, to try to determine to what extent consumers can be induced to effect some redistribution of their resources in favour of that particular manufacturer's product. We have it as the considered opinion of some large producers that, for some products, the design, convenience and attractiveness of the wrapper is often more important than the quantity or quality of the product within.¹ This need not be taken literally, for the contents are well known to the consumers of these products, but it does tend to show how much study is being applied by manufacturers to the reactions of consumers.

The conclusion seems to be that whilst many firms do make some tests of elasticity by simple methods, there are perhaps more firms who either make no experiments at all or make them only for very short periods and cannot isolate the effects of the change in price from other causes which affect their sales. Many entrepreneurs are reluctant to change their prices merely as an experiment or test of what the possibilities may be, and for this they give some or all of the following reasons:

- (1) They apprehend that rival firms or other manufacturers of close substitutes for their product will also adjust their prices, particularly if a reduction is in question, and if sales do not respond sufficiently the profits will obviously be lower on the same or similar turnover.
- (2) Manufacturers meet with resistance occasionally from wholesalers and retailers who work on fixed margins of profits, to (either or both) increases and decreases in prices.
- (3) Neither consumers, selling agents, nor travellers, favour experiments of this kind, and particularly where the prices of the goods may appear in price-

¹ Upon non-price competition generally see Burns, *op. cit.*, p. 372 et seq and Hotelling, 'Stability in Competition', *Econ. Jnl.*, 1929, 39, 41.

lists and catalogues they dislike the insertion of slips or other notices altering the prices.

- (4) In some cases they state explicitly that they believe the demand to be inelastic for all similar products taken as a group or industry, and in view of (1) above, there is nothing to be gained by reducing prices as an experiment. Increases in prices are rarely considered without some other stimulus; certainly it is rare for prices to be increased merely as an experiment.
- (5) In most cases entrepreneurs state that they do not believe the demand for their product is elastic enough for any practicable change in price in respect of their own product alone, assuming that rivals do not change their prices and that increased profit is not to be found in this experiment.
- (6) Some manufacturers maintain that if the reduction in price is to be of a size large enough to influence sales, their costs will not fall sufficiently to maintain or increase their current rate of profit.

Generally where the firm is a price-fixing or dominant firm it can only experiment with prices by altering them when making up its budget. The price when fixed will apply to a period as long as 12 months ahead. There is obviously need for great caution, in such cases, when proposing price changes which will affect the output of the firm for such a long period as 12 months.

I think that the foregoing information, all of which has been culled from the answers to the questionnaire or from general conversations with entrepreneurs,¹ emphasizes an important change in the manufacturer's outlook from that to which we were accustomed only as little as 15 or 20 years ago. No doubt the tendency is seen more clearly in all those newer industries making partly standardized or mass-produced products, which have grown up in Great Britain so recently. But in a minor way it is showing its effects in the older industries as well. Until quite recently nearly all manufacturers centred their organizing ability upon the productive plant and equipment of their enterprise and almost neglected the demand aspect of the manufacturing problem. A new outlook upon scientific management has undoubtedly

¹ Cf. also Hall and Hitch, *op. cit.*

been forced upon manufacturers by the necessity of themselves taking in hand the determination of the selling price of their products. Many of these products change in design, style, quality, and in cost of production at fairly regular intervals. Therefore, a complete review of all the affairs of the enterprise is required at those times when changes are being proposed. Formerly a manufacturer would continue to make and sell an article which had changed very little over a long period of time. He would find no great difficulty in keeping up a normal output and would not have to meet the aggressive price policies of other firms. His costs of production were relatively stable and frequent changes of price were not forced upon him, nor did he deem it necessary to make small changes in price in respect of trifling changes in cost of production.

The present tendency of industry is towards continuous experimentation and research in the practical methods to be adopted to distinguish the product of one manufacturer from that of another, and whenever possible to make a big cut in selling prices if possibilities of reducing costs by improving the speed and technique of production are detected. Under such conditions the manufacturer is bound to seek means of assessing the demand for his product. We think that some of the dominant firms may be induced to produce some of their records in the future, and there is every reason to believe that some of them will show that market research has developed, within those individual firms, very considerably in the last few years. At the moment such records are not available for examination, but it is important to have discovered that such information exists, and if it is forthcoming it may prove very valuable for economic research.

Rival Commodities. We understand that most producers are active in seeking information about the sales of other products which consumers may regard as substitutes for their own. When considering the output plan for a forthcoming period of production, producers usually have brought up for consideration information collected from their field service organization or agents, about consumers' reactions to the quality or price of these substitutes. It is not to be supposed that in general the information gathered

in this way is of great value, but a producer obviously takes notice of any information coming to him about changes in quality, style or design of substitute products, which might bring them into closer competition.

There is no reason for thinking that there is any possibility of producers formulating even a vague idea of the elasticity of substitution of one or more of these substitute products for his own. The producer gains some indication of the possibilities and if he can effect any more elaborate differentiation of his own product from all the others he uses his technical ability to achieve the desired effect.

In this analysis we have examined demand first, for the reason that in the newer industries, at any rate, demand is always the first section of an output plan to receive attention. This obviously is because the producer has already knowledge of his average costs of production at various scales of output which have been achieved in the past. The fundamental question, therefore, is what is the demand for the product likely to be over the period projected ahead? If a fairly reliable forecast can be made, the rest of the plan usually follows, but the margin of error is always likely to be greater in the computation of expected demand than it is in the case of expected costs of production. As we have indicated above, manufacturers, particularly of the newer products, do not regard the costs of any product to be so firmly fixed that they cannot be changed to produce the article which the consumer demands, if they can get to know what he requires and the price he will pay for it.

IV

COSTS OF PRODUCTION

The Product to be Manufactured in the Period of Production.

When considering the demand for the product of the firm, producers usually have before them drawings, specifications, and technical details appertaining to the product, in various types, designs, or styles, the expected cost of production of each of which is attached. Each major or minor variation in type, design, or package is accompanied by an indication of the extent to which it will involve alterations of layout of machinery and plant, additional or reduced quantities of material and labour, and additions or reductions in costs at different scales of production. A decision is then made upon the particular types or styles which are expected to be in demand, and for the purposes of the rest of the plan it is assumed that sales of those quantities at certain prices will be attempted for the projected period ahead.

The actual decision may take one of the following forms :

- (a) He may produce the same type, quality, and design of product as in the last production period without alteration of any kind and at the same selling price.
- (b) He may produce the same type, quality, and design of product as in the last period, and alter the price.
- (c) The style, quality, or packing of the product may be altered and the same price as last year maintained.
- (d) The style, quality, or packing of the product may be altered and the selling price also.

In each case where there is to be an alteration in price, it may be a reduction or an increase, an alteration in the type, kind, quality, or design of the product may reduce or increase costs or leave them unaffected. Where several products are manufactured the relative proportions of output may be varied each season of production.

Output. Whatever may be the volume of sales anticipated in the projected period ahead, it is necessary to know the output of which the plant is capable. If the sales programme necessitates additional plant or an alteration of layout, an

additional budget is usually prepared of the programme of extensions over a much longer period than the current season of production. Generally an enterprise expands gradually and small changes in layout or additions and replacements of machinery take place in the ordinary run of a year's working, but in some instances, especially where the newer products are concerned, expansion may take place rapidly, and in these cases a long term plan of building and equipping additions to the factory at certain intervals is prepared, and amended from time to time in accordance with the policy of the firm and its estimate of the future demand. But for the output plan of a product, for a period of production, before estimates of costs can be prepared it is a necessary condition for the formulation of expectations about costs, that the output should be indicated upon which the estimates are based. There is often a great deal of difference in average costs based upon the maximum output of the plant, and those based upon a normal, usual, or expected output.¹

In allocating oncosts over a variety of products it is obvious that in most cases the assumption of a normal output of, say, 80 per cent of the maximum, will show a result substantially different from that obtained by the assumption of maximum output. Moreover, as will be discussed in detail later, marginal costs may or may not vary considerably over ranges of possible output fairly wide apart.

Reference to the answers supplied to the questionnaire shows that the output assumed when making estimates of cost are very rarely as high as the full maximum output of the plant.² In the few cases where this answer (i.e. that maximum output is expected) is given, it is reasonable to infer that the maximum is not as high as that amount of output which would be achieved if the plant was operated under perfect conditions for the whole year. In general it refers to the maximum achieved at some time in the firm's past experience, and this will always be less than the output under perfect conditions of performance, and may, in general, be regarded as expected normal output.

The general case is for a producer to base his costing upon

¹ See App. III, Q. 12.

² See App. III, Q. 11.

the assumption that a normal or standard output is possible,¹ and this will be less, and often a good deal less, than the full maximum possible output. The actual percentage of full maximum output which is assumed as a normal or standard output, will vary not only according to the industry and the kind of plant and machinery in use, but also according to the experience of the individual firm. Some replies indicate that a quite low percentage is assumed; there is one of 55 per cent and several of 60 per cent and 70 per cent, and quite a number of 75 per cent. Obviously no sort of average of these cases has much meaning; everything depends on the conditions in the industry, and particularly those under which the firm itself is working. If a large number of instances were collected covering all industries, the mode would probably fall between 80 per cent and 85 per cent.

Not many firms appear to find it necessary to keep a special reserve of plant in existence to meet emergencies. When a standard or normal output is assumed the difference between that and the maximum output is regarded by most firms as a margin to meet emergencies and to cover temporary breakdowns, adjustments, repairs, and renewals. But in some industries it is obvious that in some sections which may be more prone to breakdowns than others, a definitely ear-marked reserve will be desirable and is often kept, in order to maintain normal output.²

Costing. The answers to the questionnaire confirm the observation that for pricing purposes estimates of cost have to be prepared in advance of actual production. The estimates may vary from an ill-informed guess of what the cost is likely to be, to a fully detailed and methodical system of standard costing and budgetary control. Their significance for economic theory may be regarded as identical; the same result is apparent, that the price at which the greater part of output of goods is sold is not related to the actual cost of production, but to those estimates of cost which enter into an entrepreneur's expectations when he is making his

¹ i.e. for a producer who has any power at all over the price of his product and intends to fix the price by reference to cost of production and his own estimate of demand.

² See App. III, Q. 14.

decisions about the amount of output and the selling-price to be fixed for it.¹

There seems little to be gained by an analysis of the details entering into the entrepreneur's expectations of costs, in those cases where there is no attempt to systematize their computation. The simplest case is that where the estimates of cost are taken from previous years' figures as a basis and adjusted by expectations of changes in the price of raw material and wages, which enter into the finished product. The use of such simple estimates is still quite common, and in those industries where technical change is not rapid it probably gives results of sufficient approximation. In these cases the expense of setting up a detailed system may militate against its use where its advantages are not obvious.

It is interesting to observe that in some industries where the product is sold on marts or exchanges and the firm has, therefore, practically no control over price, it has been found desirable to make up a budget plan and to adopt standard costing.

Standard Costing. Firms who fix their selling prices rigidly for a period cannot actually know in advance what their average costs over the period will be; it is, therefore, necessary for them to have some system of forecasting costs which promises a reasonable degree of accuracy. To control costs during the period of production, indications of divergencies of actual from expected costs must be available immediately they occur. The older method of post-costing by the unit or batch method was ineffective in this respect. The costs could not be calculated until all the processes or operations in respect of a batch of products were completed. Meantime, processes were continuously in operation, and the management, when excess costs were discovered, could not always discover the exact process where they occurred, and in any event other losses had occurred and were occurring whilst the costing department were waiting for the final figures in respect of earlier batches.

A system has now been developed which is designed to show the cost of each separate process or operation performed

¹ See App. III, Q. 18.

in the manufacture of a product.¹ Each process or operation is analysed or broken down into the simplest form, and after tests and experiments have been made a standard or ideal cost is set up to show what the cost should be under certain assumptions. The assumption usually made is that each operation will proceed smoothly and harmoniously and there will be no wastage of material or effort at any point. If the standard cost is expected to be one which can be attained in practice, an allowance is then made for inefficiencies which are normal in respect of the particular plant or workman involved. When the cost of material and of all these processes is summed, the total provides the standard or ideal cost of that article.

At any time when the number of processes applied to a product is proposed to be changed, the firm has figures available to show the difference which will be made to costs of production without the necessity of first making a batch of products and waiting for all the processes to be completed and costed up.

This system of costing is now used by a large majority of firms who fix the price of their products for some definite period ahead. It is claimed that it provides a more accurate measure of what costs are likely to be. In a system of post-costing in respect of batches of products, the only guide to future costs is the average costs of some past period. Included in these past costs there may be items of expenditure which are unusual and could possibly be eliminated by a closer inspection of processes. The installation of a system of standard costing compels production managers to analyse the processing operations at each stage of the manufacture of a product, and to calculate the cost of each process. This is found to be more satisfactory in practice than to ignore the processing operation and lump together different products going through various departments. If a firm is following an aggressive price policy it is essential that costs which arise from inefficiency of the organization and idleness of the plant should be brought to notice quickly and corrected; sales may be lost if these costs are included in the

¹ The Select Committee on National Expenditure (4th Report 1940-1, 18th in series) pp. 14 et seq. refers to 'Standard Costing' as 'technical costing' and discusses the advantages and disadvantages of using the system for price-fixing for government work in war and peace-time.

basis upon which prices are fixed. A system of standard costing enables the cost of processes or operations to be checked up daily or at short intervals, whereas the costing up by methods of post-costing of batches entails long delay.

The objects of standard costing are:

(a) To provide a close estimate of the cost of producing an article over a period of production ahead, to serve as a basis of price-fixing. Actual costs averaged over any part of a full season or period for which prices are rigidly fixed, may vary considerably, but if averaged over the full period are expected to conform fairly closely to the standard. If the standard costs are ideal costs and not an attainable standard, an adjustment is made for purposes of price-fixing, to provide for normal inefficiencies.

(b) As selling-prices are not free to vary with changes in costs which may occur during a season or period of production, actual costs must be controlled to keep them as near as possible to the expected costs. Therefore, the system of standard costing is used to provide a standard of reference or a measure or gauge with which to test the actual figures of manufacturing performance in terms of time taken or money cost. The causes of variation in cost by inefficiency and waste of material may be traced at short intervals to the process or section of the factory where they have occurred. The management point or section which is in default can be traced and inquiries begun to attempt to devise some means of eliminating the losses. Similarly, if actual are lower than standard costs, an explanation is required in case some process has been scamped or inaccurately applied, or the processing of the product is not being carried out as decided in the plan of production.

(c) Standard Costs serve as ideal costs to represent an objective for all sections of the management, and attainment or otherwise of close approximation to the ideal, may be a measure of their efficiency as managers of their respective departments.

Basis of Standard Costs. The basis upon which standard costs may be set up or computed takes two distinct forms into which all the systems and possible variations will fall.

(1) To set up an unattainable ideal which when com-

puted or set up will not appear to be attainable in practice; or

- (2) To set up an attainable ideal, to which close approximation is expected and often attained.

The merits of the two systems will appeal the more strongly to managements of different industries, in accordance with the nature of the product they manufacture, and the ease or otherwise of setting up performance standards and correcting the costs to make them serve as a basis for price-fixing, for which purpose they are used in lieu of actual costs.

Kearsey at the beginning of his book (*Standard Costs*) appears to favour a standard which will be fixed in such a way that it will not normally be attained.

A cost standard is an accurately developed measure of the cost of performing specified work under certain stated conditions. Cost standards should not be based upon normal or average costs. They are, in a sense, model costs, and are intended to serve as objectives for attainment. Records of previous performance, unless qualified by sufficiency of detail with regard to methods and conditions, are of no assistance in developing standards. Obviously, cost standards must be adjusted for use in calculating sale prices. The methods for bringing cost standards into alignment for the purpose of price-fixing constitute a part of the mechanism of accounting. The reason for this adjustment in level is that actual costs in total are inevitably in excess of standard. Standards sometimes will be attained but more often will not. The scientific conception of a standard must never be forsaken if complete and accurate control is to be maintained. Therefore, for price-fixing, cost standards must be increased by appropriate increments to cover a reasonable proportion of the difference between actual and standard costs.

But when (at p. 36) he comes to determine the plant utilization which is intended to serve as a basis for the costing of the standards, he utilizes a predetermined proportion of the total maximum hours likely to be worked which is below normal and much below the maximum capacity. Moreover, in setting up labour standards he proposes a standard or model cost for the particular plant and an inefficiency allowance which sets a standard of presumable failures. He regards the sum of these constituents as providing the cost at which output should be produced and which must be used for price-fixing purposes.

It is not clear that there is any advantage to be gained by setting up two sets of standard costs, one to act as an ideal and the other to be used for purposes of price-fixing, and we do not think that many industries actually do follow such a course. In general, the standard will be set up at least as a guide to the expected performance of the plant, so that with but minor, or without any modifications, cost computed by reference to the standard can be used for purposes of price-fixing.

The second and most usual method of devising a system of standard cost is to provide an attainable ideal which, taking one period with another, may be reached on the average. The costs actually incurred may be expected, under usual conditions, to approximate reasonably closely to the standard cost. Reference to the answers given to the questionnaire shows that a highly significant proportion of the firms who have replied, covering diverse industries, actually use a system of standard costs for the purpose of price-fixing.¹

In setting up the standard costs, especially if they are to be used for fixing a price which will only be altered in exceptional conditions during a period or a season of production, it is evident that a producer will compute it in terms of some average over the whole period projected ahead. In other cases where there is an opportunity to review prices at shorter intervals, the standard itself may be adjusted periodically to reflect changes which have taken place during the season. The first consideration is the determination of a normal annual output, or predetermined utilization of plant and equipment. The most typical procedure seems to be to adopt a normal output; that is an output of which the plant and organization is deemed to be capable without strain or stress and allowing for standing time for the repairs and renewals which may be normal to the individual firm or expected in the industry. This normal output is often stated in terms of a percentage of the maximum possible through-put or volume of output of which the machine or plant is capable if run at maximum speed for a full working year or production period, and

¹ See App. III, Q. 19. Also Select Committee par. 35: 'This technique is familiar to the great majority of the firms with which they deal being an established method of fixing prices in the firms' commercial business in peace-time.'

without any rests or intermissions. We find that in some industries the assumed capacity for expected smooth and comfortable running, may be as low as 60 per cent of the full maximum. Therefore, if the producer has worked his plant, in any particular period, under conditions different from normal, his overhead expenses for each process require adjustment. The normal expenses of plant operation are then calculated, omitting those which are known to be non-recurrent or exceptional. Alternatively, in the case of some industries, each separate process or operation will be subjected to examination to determine the normal performance in terms of time or money cost, and the figure obtained will be taken as the standard. For example, the standard cost of running a machine for an hour may be calculated on the basis that it will be used for a certain number of hours in the production period, and that a certain number of units will undergo the machining process during the course of the production period. From this the standard cost of the machine operation per unit of product may be calculated. There are many differences in detail and methods of costing, but in fixing a standard the object is the same, to set-up a standard of expected performance which under conditions of normal operation of the plant and equipment, is expected to result.

It is difficult to determine to what extent those producers who use standard costing as a basis for price-fixing are enabled the more easily to project their minds into the future period of production, than they would be if they relied, as they used to do, more extensively on the result of past operations. We know that in the past many producers relied almost exclusively on their trading accounts for an average of the results of past periods, as a basis or starting point upon which to form their expectations of costs in a forthcoming period. It does seem clear that whatever system is adopted, the producer includes in his estimate of future costs those alterations in rates of wages or cost of material which he can foresee, either in detail or in the large. But whereas the impact of changes in costs under these two headings may fall not upon all but upon some process in the manufacture of the product, the total effect is much more clearly brought to notice under a system of standard costing.

For the adoption of the system necessitates the breaking down or analysis of the productive operations, into separate processes to which, of course, separate wages rates may be applicable. Further, when decisions are being made at the crucial time, attention is focused upon each separate process and the expected cost of working it during the forthcoming period of production. The extent of this analysis is determined very much by the nature of the industry and complexity or otherwise of the product. In those cases where frequent changes are possible in the number or nature of the processes, a system of standard costing enables rapid calculations to be made of the changes in cost which will arise on changing the design or style of the product.

CLASSIFICATION OF COSTS

General. It is clear from the above that the practice of fixing prices in relation to actual costs incurred in past periods of production, is changing considerably. In the past the only influence which actual costs had on prices was to the extent only that the entrepreneur used them as a guide when forming his expectations of what costs were likely to be incurred in producing output for a period of production ahead. Certainly it was too late to translate variations in costs into changes in prices of products for which contracts of sale and delivery had already been made, although production had not been completed. It was a defect of the methods of costing then in use that variations in costs did not show up in time for action to be taken to smooth them out, and ensure that over a period the average approached that assumed for the purpose of price-fixing.

The adoption of a system of standard costing does not in itself serve the purposes of recording actual costs, and post-costing in respect of processes or operations is required and used for purposes of control. Though the record of actual costs is not used for price-fixing, indications of changes in cost are required in case the standard costs themselves may at some time require revision.

If an attainable standard of cost is set up the actual costs are computed so that the budget expectations and the accuracy of the estimates made can be checked with the ascertained results. To this end the same classification of costs and the methods of imputation are utilized for the purposes of standard and actual costing. In effect, the setting up of the standard is partly dependent upon the information collected by the actual costing system, and once the manufacturing processes have been divided in a manner appropriate to the form of the standard costing system, the actual costing proceeds on the same lines.

The actual imputation of costs obviously depends to a very large extent upon individual judgment.¹ In the case

¹ Select Committee 4th Report Part II, ii. 'The calculation of overhead costs on a particular contract involves the allocation of the proportion of overheads which is appropriate to that contract; this requires the expert judgment of the accountant.'

of direct costs of material and labour engaged on one product only, imputation is simple for all practical purposes. But in the case of works costs, particularly in a factory which produces a variety of products, considerations of policy may influence the imputation of these costs. Certain practical methods of imputing these costs tend to become customary in certain branches of industry, and writers of textbooks on cost accounts regard these practices as principles which ought to be followed. But even in the application of these principles, if followed by several manufacturers in an industry, there are divergencies which make it difficult to compare the costs of one firm with those of another.¹ This is mainly a result of the different proportions in which a variety of products are produced by the firms in the industry. A uniform system of costing, if adopted by most firms in an industry, may make comparison somewhat easier, but as the allocation of indirect costs over products produced in different proportions is bound to vary between firms, to this extent the unit costs of any product will be affected.

Systems of 'standardized' or uniform costing have been published for several industries²; they are not to be confused with a system of 'standard costing' used by a firm in respect of its own particular processes. There is no connection between them; the former is only a special method of collecting costs and spreading overhead costs in some arbitrary way which is recommended and it applies only to the industry for which it is devised. The latter has been described above.

Prime Costs and Overhead Costs. Costs are divided by business firms into direct and indirect costs, often called prime costs and oncosts. The economist, for the purpose of analysis, distinguishes between prime or variable costs and fixed costs or overhead costs. The term 'supplementary costs' used by Marshall for fixed costs will not be used, as it has been used in a different sense by J. M. Keynes. The classification of the items in the costs as prepared by cost accountants or business men is not the same as that ordinarily

¹ Select Committee, par. 42.

² e.g. Master Printers Standardized Costing System.

used in discussions by economists. The economist, particularly for the purposes of the short period analysis, describes the conduct of the firm on the basis that some costs are fixed and others are variable with output. Writers of textbooks on cost accounts do not use this classification, and producers, in practice, generally use terms describing costs which do not, in themselves, distinguish clearly between fixed and variable costs.

In the main the classification made by producers is intended to serve the purpose of designing a costing system which can be installed and used to suit the methods of manufacture and the information and records which can be made available. Those costs which are immediately imputable and easily recognizable as such from invoices or stock books and from wages sheets, are called prime costs. They are easily distinguishable and separable from other costs of the general conjuncture which is shared in various proportions by all the products passing through the factory. The cost of raw material which can be weighed or measured in respect of each product, and the wages paid to operatives directly employed upon that product for a measurable period of time generally presents no difficulty of imputation, and the margin of error or arbitrariness is small. Broadly, it is generally understood that prime costs represent the first cost or outlay on the materials embodied and labour directly employed in the manufacture of the given product. When manufacture was simple and machines employed were few, the greater part of the factory cost of a product consisted of actual raw materials purchased and the manual labour employed in making or shaping them into a finished product. But in industries where expensive machinery is employed, often on a variety of products, the cost of which is to be spread on some arbitrary basis, the method of imputation is of great importance in deciding the total cost of the product.

The difficulty in harmonizing the economist's classification of costs and that used by the business man is that the latter includes in oncosts many items which vary with the scale of output, so that we cannot regard the economists' concept of prime costs as the same as that of the business firm. For the same reason oncosts are not the same as fixed costs.

The distinction between prime costs and fixed costs used

by the economist has the effect of including in the concept of prime cost all and every expense of the firm which varies, although not necessarily varies proportionately, with the volume of output. The test applied is whether or not the expense is fixed, irrespective of the volume of output or whether it will vary in some way with output.

The same test can be applied in practice, but the analysis of the figures in some industries would have to be specially made as it is not found easily by the methods adopted for ascertaining cost. The producer may classify his indirect costs under the two headings of works oncost and general overhead and office expenses, and it will generally be found that included in the works oncost are many items of expenses which vary with the volume of output. If in any particular case these expenses were abstracted from the total of works oncost and added to the total of direct cost, the sum would approximate closely to the economists' concept of prime cost.

Similarly, if the fixed charges and expenses included in works oncost were abstracted and added to establishment and overhead and office expenses, the sum would represent fairly closely the economists' concept of fixed charges; that is, those which do not vary with the volume of output.

Many of the entrepreneurs' crucial decisions are made upon a consideration of the proportion of total cost which is composed of prime cost and fixed costs, in the sense used by economists, but the figures have to be specially sorted out. It is curious that entrepreneurs recognize the distinction between and the significance of variable and fixed costs, but the terminology used in many costing systems has not been amended to suit. It is necessary to know the fixed and variable costs, and to decide their relative importance, to apprehend the significance of entrepreneurs' actions and to determine what is likely to be their course in certain circumstances.

The proportion of costs which are absolutely fixed irrespective of the volume of output, varies considerably, dependent upon the methods of production employed, the size of the plant, the nature of the industry, and the policy of the individual producer. For example, in some industries it is the custom to close down the whole or a section of the works

for a short period, and all expenses (except depreciation of plant) cease. The only fixed expenses continuing may be those of office staff, and in some cases these too may be cut down. In other industries it is not possible to cease production for a period and to start up again at will, and in these instances some of the expenses which are variable with output may not be much diminished by reason of a substantial reduction in the volume of output. It is desirable, therefore, to know exactly the technical conditions of the industry and of the firm before a decision can be made as to which costs are fixed and which are variable with output.

For the purpose of analysing costs in the most significant way to relate them to entrepreneurs' decisions, the following classification is suggested. It is based upon the practice of cost accounting, and is convertible to provide the figures required for the economists' concept of variable and fixed costs.

PRIME COST	1. Raw material and semi-manufactured goods purchased.	<i>Proportionately variable.</i>
	2. Wages of direct labour.	<i>ditto</i>
	3. Plant operation, power, indirect labour, repairs and renewals, and wear and tear.	<i>Whole or part variable, but not proportionately with output.</i>
WORKS ONCOST	4. Preliminary costs of setting up machinery, preparing dies, tools, jigs, patterns, etc. (and cost of short period plant written-off in the period of production).	<i>Part variable for plan but becomes fixed after production has commenced.</i>
OVERHEAD COSTS OR OFFICE COST	5. Selling Costs.	<i>Usually fixed.</i>
	6. Establishment and General expenses (depreciation, if any, due to causes other than use of machinery).	<i>Fixed.</i>

In examining the items entering into costs it will be convenient to comment under each heading upon the nature of the expenditure, upon its significance in the budget or output plan, and at various points to indicate reconciliation between the entrepreneurs' and the economists' concepts.

Raw Material and Semi-Manufactured Goods. The cost of raw material for many industries is the most important item entering into costs. There are only a few firms whose organization covers all stages of production, from the growing or extraction of the raw material to the sale of the finished product. There are a few noticeable instances such as the Lever Brothers combine and the Ford Motor Works, to mention two very different industries, where the producer of finished goods appears to undertake, in his own name or through various subsidiaries, practically every stage of production from the raw material to the finished product ready for sale to consumers. As indicated above, most raw material or crude products are bought and sold on organized produce markets, marts, or exchanges, and for the individual buyer the market may be rightly regarded as a nearly perfect market. The amount any individual buyer stands ready to purchase has little or no influence on the market price. Of course, a large buyer may have some advantage over smaller buyers in so far as it is usual in the case of some products for special bargains to be made to cover large lots at one time, over long periods, and at special prices. But in general the main advantage of the large firm is that its cash resources may enable it to buy at a favourable time and hold stocks.¹

The organization of British industry is such that the manufacture of finished goods ready for sale is usually divided up into several (they may be few or they may be many) processes, only one or a few of which are undertaken by any one firm or associated concerns. The finished product of one section of industry is most suitably described as an intermediate product when it becomes a raw material or semi-manufactured product for another industry, which is applying another process required to fit the product for the use of final consumers. It is well to notice that it is not necessarily the manufacturer who completes the last in time, or finishing process, in respect of certain goods, who undertakes the risk of assessing the demand for and the price-fixing for and marketing of the product. In the woollen industry, for example, the spinning industry manufactures a product which as far as that industry is concerned is a finished product, but which becomes raw material for the

¹ Burns, *op. cit.*, p. 6.

weaving industry. After this industry has completed its operations on the product, the cloth is sent to dyers and finishers who usually work on a commission basis. The risk of the product finding a sale and the price fixing in respect of it, is not undertaken by those who apply the last or finishing process but by the weaving industry, which takes over the final product for marketing. It is also interesting to observe that the intermediate product which emerges at most of the earlier stages of processing is sold, in general, on marts or commodity exchanges or through similar organizations, where the price-fixing is automatic or semi-automatic, and mainly outside and beyond the influence of any one or a small group of buyers or sellers. There are a few notable exceptions to this generalization, such as the rayon industry. This is a new industry and in recent years it is understood that the number of firms engaged therein has been reduced substantially, and one or two may have control of such a significant proportion of the total output that they are in a position, if they so desire, to exert some influence upon the price at which this intermediate product is sold.

In each separate industry it is possible to determine the stage when the influence upon price by the individual firm becomes possible or likely, and it will differ with almost every industry. In general, the firm which undertakes the risks of marketing and takes over the product when it is completed and ready to be sold through the usual wholesale and retail channels to final consumers, is one which on account of its proportion of total output or other circumstances can influence the price at which it is sold to final consumers.

From the above the most useful generalization which can be made when analysing the elements which enter into the price-fixing process is that the producer who is in a position to fix final prices for finished goods purchases his raw material, intermediate or semi-manufactured goods, in a large market which, for all practical purposes, may be described as nearly a perfect market. Such a generalization applies to the majority of products entering into British industry.

Semi-Manufactured Goods (or parts). In recent years there

has grown up in the engineering industries, particularly the motor industry, a system whereby various parts or fittings to be incorporated in the finished products are purchased by the main producer or owner of the assembly plant, from smaller specialist firms. The producer who completes the final stages or assembly, and undertakes the risks of marketing and has also, in most cases, the opportunity of price-fixing, is usually in a very strong bargaining position compared with the smaller firms from whom he buys the parts or fittings. Some of these small manufacturers may make only one part or fitting and it may be suitable for use by a single manufacturer. The parts so made would often be useless to any other than this particular manufacturer, as they may be unsuitable or unusable as components in a product designed differently and in production by another manufacturer. At first sight it may appear that the buyer has complete control of the price to be paid to the sub-producer, and that he is in fact a monopsonist. It is possible that in some cases such a situation could arise. In practice it is evident that when the main producer is following an aggressive price policy and progressively reducing the price of the main product, pressure may be brought upon sub-producers to reduce their prices every time a new contract is being negotiated. If the sub-producer has set up special machinery for the manufacture of these particular parts and no others, his bargaining strength is weakened. But, on the other hand, the specialist sub-producer cannot be replaced easily at short notice, and to that extent he can use his awareness of the fact to support his demand for a remunerative price for the product. The main producer is dependent upon the sub-producer for maintaining the flow of an adequate supply of parts for incorporating into the main product. It is understood that some of the main producers rarely use the powers they have to force down the prices of parts manufactured by sub-producers, unless at the same time they are able to indicate the technical methods by which the sub-producer may reduce his costs of production. Probably there are not many 'single-liners', as it is the object of most firms to produce alternative products so that if the demand for one fails they can switch over to another with the minimum difficulty.

Contracts for Supplies. Those producers who fix their selling prices in such wise that consumers do not expect them to change during a period or season of production, or in accordance with trade custom, and normally give a fair length of notice before making changes, endeavour to make contracts at fixed prices to run over a period or season of production. Obviously, in the situation where the producer, by making contracts, can import some element of rigidity into his costs, he is reducing substantially the risks of changes in his buying prices upsetting his budget plan. Therefore, it is common in those cases where a producer either holds himself out to maintain a fixed price for a season or it is customary in the industry to maintain that price, for costs to be stabilized over the period by entering into fixed contracts for supplies for the season.¹

The answers to the questionnaire show that it is possible and quite usual for raw materials to be bought forward at fixed prices, but generally the maximum length of period will be short and will depend on the season in which the crop matures, is shipped, or produced. Often the smaller firms purchase their requirements from time to time as required, and do not speculate on commodity markets. But, as shown above, most industries in which firms can be shown to have some control over the price of finished products, do not purchase raw materials or crude products but materials which have already been subjected to one or more processes or are semi-manufactured. The form of contract takes many forms ranging from complete rigidity to a loose form of arrangement which may make the price subject to alterations in the suppliers' costs of raw materials and wages. For example, some firms who maintain their selling prices unchanged for long periods, are able to make contracts extending over as long as three years for a large proportion of their partly processed material and semi-manufactured goods. These contracts do not include any break clauses nor variations in price of any kind. Many firms are able to arrange such contracts, which entirely avoid their being faced with increases of costs of such materials for a period of three to twelve months.²

The actual percentage of the total purchases of any one

¹ See App. III, Qq. 35-6.

² See App. III, Q. 21.

has grown up in the engineering industries, particularly the motor industry, a system whereby various parts or fittings to be incorporated in the finished products are purchased by the main producer or owner of the assembly plant, from smaller specialist firms. The producer who completes the final stages or assembly, and undertakes the risks of marketing and has also, in most cases, the opportunity of price-fixing, is usually in a very strong bargaining position compared with the smaller firms from whom he buys the parts or fittings. Some of these small manufacturers may make only one part or fitting and it may be suitable for use by a single manufacturer. The parts so made would often be useless to any other than this particular manufacturer, as they may be unsuitable or unusable as components in a product designed differently and in production by another manufacturer. At first sight it may appear that the buyer has complete control of the price to be paid to the sub-producer, and that he is in fact a monopsonist. It is possible that in some cases such a situation could arise. In practice it is evident that when the main producer is following an aggressive price policy and progressively reducing the price of the main product, pressure may be brought upon sub-producers to reduce their prices every time a new contract is being negotiated. If the sub-producer has set up special machinery for the manufacture of these particular parts and no others, his bargaining strength is weakened. But, on the other hand, the specialist sub-producer cannot be replaced easily at short notice, and to that extent he can use his awareness of the fact to support his demand for a remunerative price for the product. The main producer is dependent upon the sub-producer for maintaining the flow of an adequate supply of parts for incorporating into the main product. It is understood that some of the main producers rarely use the powers they have to force down the prices of parts manufactured by sub-producers, unless at the same time they are able to indicate the technical methods by which the sub-producer may reduce his costs of production. Probably there are not many 'single-liners', as it is the object of most firms to produce alternative products so that if the demand for one fails they can switch over to another with the minimum difficulty.

Contracts for Supplies. Those producers who fix their selling prices in such wise that consumers do not expect them to change during a period or season of production, or in accordance with trade custom, and normally give a fair length of notice before making changes, endeavour to make contracts at fixed prices to run over a period or season of production. Obviously, in the situation where the producer, by making contracts, can import some element of rigidity into his costs, he is reducing substantially the risks of changes in his buying prices upsetting his budget plan. Therefore, it is common in those cases where a producer either holds himself out to maintain a fixed price for a season or it is customary in the industry to maintain that price, for costs to be stabilized over the period by entering into fixed contracts for supplies for the season.¹

The answers to the questionnaire show that it is possible and quite usual for raw materials to be bought forward at fixed prices, but generally the maximum length of period will be short and will depend on the season in which the crop matures, is shipped, or produced. Often the smaller firms purchase their requirements from time to time as required, and do not speculate on commodity markets. But, as shown above, most industries in which firms can be shown to have some control over the price of finished products, do not purchase raw materials or crude products but materials which have already been subjected to one or more processes or are semi-manufactured. The form of contract takes many forms ranging from complete rigidity to a loose form of arrangement which may make the price subject to alterations in the suppliers' costs of raw materials and wages. For example, some firms who maintain their selling prices unchanged for long periods, are able to make contracts extending over as long as three years for a large proportion of their partly processed material and semi-manufactured goods. These contracts do not include any break clauses nor variations in price of any kind. Many firms are able to arrange such contracts, which entirely avoid their being faced with increases of costs of such materials for a period of three to twelve months.²

The actual percentage of the total purchases of any one

¹ See App III, Qq. 35-6

² See App III, Q 21.

firm which are normally the subject of such contracts, varies over a wide range dependent, of course, on the custom of the industry and those other industries which act as suppliers of the partly processed goods. Generally, the more firmly fixed the selling price of the final product the greater the percentage of partly processed goods for which firm contracts are made for a period to coincide as nearly as possible with the period of production.

The effect of a system of firm contracts in any industry is to throw back upon the suppliers of partly processed goods or crude products the greater part of the risk of changes in prices. The price-fixing firm is enabled to prepare its budget with a fair amount of certainty that it will be free from changes in cost in respect of the largest single item entering into costs of production. Of course, there is always the risk that over the period prices may fall, in which event competitors who have not contracted for supplies may be producing at a lower cost if they are able to buy materials at a lower rate. In practice the risk is not so serious as that to be faced if the price of raw material increases in respect of a finished product, the selling price of which is fixed for a period. There may not be many firms making the partly processed goods having available sufficient capacity to accept orders at short notice during the season of production. In general the system of contracting runs with the industry and nearly all firms making either the finished product or the partly processed product, enter into contractual relations each with the other at stated times during the year.

However firm the rigidity imported into most contracts there are in industry, so it is understood, customs and amicable arrangements whereby the manufacturer of finished products often relieves the producer of partly processed goods, when it is shown that the sub-producers' costs have risen so sharply that he cannot fulfil the contract without incurring serious loss. In these cases it is believed that the producer of the finished product takes the decision whether or not his enterprise can either bear the increase in cost for a period or alternatively can rearrange its prices by agreement with the selling agencies. It is not possible to support a wide generalization; all depends on the customs of the industries concerned, the personal relationships

between the two firms involved, and the size of the increase under discussion and the length of time for which the selling price of the product has been held out to be unchangeable. At the one extreme are some firms who would not consider any alterations at all in respect of the prices of any of their supplies, and others who make it a custom to relieve their sub-producers from almost any sort of difficulties in which they find themselves. Obviously, this is partly dependent upon the availability of alternative sources of supply and the rapidity with which the substitutes for the sub-product can be produced and delivered.

At the time the budget is being framed alternative sources of supply are considered by the entrepreneur and if any supplying firm has asked for alterations of prices during any production period, it may be passed by when contracts for a forthcoming period of production are being considered.

Wages of Direct Labour. As we shall see, there are many systems of payment of wages which may arise out of the custom of the industry or the nature of the work involved.¹ When industrial operations consisted mainly of manual dexterity and skill, and where it was not possible to compute easily the actual amount of processing which could be performed by an operative in an average day's work, wages were generally paid on a time basis and not by the task or piece. The method of setting up 'labour standards' was almost unknown until recent years, and in any event would have been useless when operations and processes were unstandardized. If the selling price need not be fixed until the product is completed and it is possible to charge the customer a price for the finished article, based upon the cost of production plus profit margin, then the entrepreneur is not compelled to bear any loss entailed by the efficiency of operatives falling below his expectations. But if the price of the product, by custom and trade practice, must be fixed in advance of the production of the articles then undergoing the productive processes, the payment of wages on a time basis involves the entrepreneur in additional uncertainty. Yet many industries continue to pay time rates of wages,

¹ Cf. Cole, *Payment of Wages*.

either voluntarily or by agreement with trade unions, or they are fixed by a wages board. In these cases to obviate unforeseen changes which might affect adversely the producer's budget or output plan, it is customary for changes in wages rates to be discussed at well-defined intervals. Alternatively, if either employers or employees consider that changes in wages rates are required, the agreement provides for suitable length of notice to be given by one side to the other. This notice may be as short as three or six months, in the case of some industries, or in others it may be much longer. In some cases, but they are rare, changes are not proposed oftener than two or three years. In many industries paying time rates of wages the weekly rates are made to vary with a cost of living index, and in this event the producer in his budget takes account of alterations of which he has notice or such as he can foresee.

There are a few industries in which employees are not members of recognized trade unions or subject to trade boards. In these cases the wages are fixed by separate bargaining and changes may, therefore, take place at any time.

No matter what the system may be of governing the payment of wages calculated on a time basis, it is rare for a producer to be in a position to regard his wages rates as fixed over an entire season or period of production. No doubt on an average of a few years the gains and losses on budget figures of wages when summed will tend to zero, but there are occasions when significant changes may take place early in a season of production and be in operation a good proportion of the period. In this event the producer, who is unable or unwilling to alter the selling price of his product, is compelled to bear out of profits the whole of the increases in wages which may be conceded. Whilst it is no part of present purposes to indicate elements making for stability it does seem that a situation as outlined above might be eased if negotiations were set on foot to time proposed changes in wages rates to coincide with the months in the year during which entrepreneurs are forming their expectations for a forthcoming season of production.¹

Straight Piece Work. In many industries it has long been

¹ See App. III, Qq. 37, 22.

the custom to remunerate employees according to the amount of work which they perform. A rate is set for the piece or process or task and subject to the work being approved by a foreman or assessor, the rate is paid upon all of the work completed without regard to the total amount earned in a week and whether it varies significantly from the average output per workman or otherwise. In all industries some special allowance has generally to be made in respect of unusual or specially difficult or new and untried work.

Piece work does not always bring satisfaction any more than does time work, to employers and employees alike. From the employers' point of view it often appears necessary to review the rates for piece work and to mark them downwards to give the firm and not the employee the full benefit of the speeding-up of machinery and improvements in output, which may be in whole or in part attributable to an improvement in the factory organization or its conjuncture. The workman may restrict his efforts because the piece work rates are so high that he is enabled to earn an amount sufficient for his requirements and prefers to work at less pressure. From the employers' point of view such workmen prevent the firm from utilizing its plant capacity in the fullest and most economical manner. The workman may resist the subdividing of processes on the grounds that such subdivision is a device to give occasion for the reconsideration and reduction of piece-work rates, which have been found to be highly remunerative to the operative. The employer, on the other hand, will maintain that such subdivision is an essential part of an aggressive price policy which demands the regular review and reduction of costs to enable the product to be sold at a lower price, and to reach a wider market. It is possible to discover and examine other sources of disharmony where straight piece work rates are used to remunerate operatives, but in general the greater certainty which it gives to that section of the output plan is one of its great merits from the producer's point of view.

Efficiency Bonus System. In the engineering and some other industries a system of paying wages has been devised which it is claimed divides in some agreed proportion between employer and employee, the cost which is saved when a workman

produces more than the average or standard output agreed upon. Generally a time rate is fixed as a basic wage, upon which is superimposed the efficiency bonus. In some cases the basic time rate is fixed in accordance with an index of the cost of living, perhaps that for 1913, and to this is added a cost of living bonus which varies with changes in the index. The sum of the basic rate and the cost of living bonus is the minimum wage in that industry for the length of period agreed upon. Each job or process is then made the subject of rate fixing and the time in minutes or hours which the work should ideally or normally take is fixed as a standard or reference. If the time taken for the piece of work exceeds the standard time the workman receives his minimum wage or time rate of wages only. It is normally expected that most workmen in the factory will complete the operation in less than the standard time, otherwise the workman is regarded as inefficient and will be one of the first to be dismissed if it is decided to reduce the numbers employed. If the operation or work is completed to the satisfaction of the foreman or supervisor in less than the standard time, then the workman is credited with the agreed proportion of the time saved, and he is paid for this at the agreed rate, which is usually the time rate of wages.

The satisfaction or otherwise of the parties to the agreement depends very much on the rate fixing, i.e. the time allowances which are fixed for each operation. Until some experience has been gained there is always the possibility that the time allowances which have been fixed may have to be changed either in favour of or against the workman, and friction may result. To avoid contention upon the subject many large producers go to a good deal of trouble and expense to ensure scientific rate fixing. The procedure is somewhat as follows.

The costing office sets out the plans and drawings of the work which has to be done and attaches to the whole job or to the separate parts of it, the time allowance or the amount of wages estimated and allowed for in the production plan. Well-trained and experienced rate-fixers are employed to take up the drawings and analyse the job into as many working parts as fit in with the present organization of that section of the factory. Each part is then processed on the

machine which the workman will use, by a demonstrator, works foreman, or in some cases by the rate-fixer himself. A Trade Union representative is often present to watch the work proceeding and to check up the time it takes when effected by the demonstrator. It is often argued, when contesting rates which have been fixed in this way, that the rate-fixer or demonstrator is such a skilled and expert man that he can effect the operations in a much shorter time than any workman normally engaged upon that class of work. To overcome this difficulty in part, some producers then allow an ordinary workman to work on the job for a week or two and then check up his times again at a stage when he has become accustomed to the work and performs it in the most expeditious manner. As a further concession to the workman some producers regard the average workman as displaying about 80 per cent or some similar proportion, of the efficiency of the demonstrator, and they adjust the time for the job suitably. In spite of all these precautions to ensure fairness in the rate fixing, difficulties do occur. Quite often the workman whose job it is to perform the process regularly, develops a dexterity and speed out of all proportion to that which was expected, and is materially helped by the works organization which has been developed in that section of the factory. In this event he may earn such a large efficiency bonus that he becomes an object of envy to workmen in other sections of the factory who have not been so fortunate. Great discontent is inevitable if the rates fixed have to be altered to the disadvantage of the workman. Often the management find a way out of the difficulty by splitting up the processes on the job in a different way, or by creating some further subdivision. The case for altering the time allowed and going through the process of rate fixing again can thus often be substantiated and the workman satisfied. In fact, where we find these systems in operation the planning department carries on continuous experiments to get greater efficiency by redesigning plant, machinery and tools, and subdividing or rearranging processes.

The marginal workman is obviously the one (or a number of them) out of a group of workmen engaged on the same kind of work, who earns zero or the smallest amount of efficiency bonus. These are the workmen who when

employment is being reduced, are most likely to be dismissed. The employer is provided with a ready measure of the average volume of output of each employee over the period, and those who habitually fail to earn the average amount of efficiency bonus are obviously the least productive. From the producer's point of view their output is insufficient to justify the expensive equipment which is provided, as the fullest use is not being made of its capacity. Generally, in these industries the cost of the conjuncture in which the employees are working is high in relation to the cost of the material and labour applied to it to produce the finished product. It is to the producer's interest to pay higher wages for high output to ensure that plant costs are spread thinly over a large output. If the fullest and most efficient use of the factory layout, plant, and machinery is not ensured the smaller output could probably have been obtained by using less expensive machinery and adopting a slower speed of production. When forming his expectations for the forthcoming season or period of production, the entrepreneur takes into account the volume of skilled labour available, and examines the state of the reserves upon which he can draw. Generally, some kind of training scheme or apprenticeship is made an integral part of the factory organization in all those industries where a fair amount of skill and precision is required. This will provide a reserve for the replacement of ordinary vacancies arising from natural causes, and to expand production as and when required. There is in existence a kind of labour preference for certain firms in an industry mainly on account of the methods in operation in the factory and the general conditions under which work is performed, as well as the average earnings upon which the workmen are able to rely upon over a period.

The amount of wages which must enter into the budget in respect of the various processes, is in most cases the least certain element in the plan. In formulating his expectations the entrepreneur allows for foreseen changes in wages rates and efficiency. Allowance is also made for technical changes in the design and layout of machinery which may speed up operations and alter wages costs. Many changes may be seen in the large, if not in detail. Surprising

changes may take place in the detailed costs of processing, but in many industries experience shows that in any normal period of production the savings by improvements and the losses by inefficiencies tend to cancel out.

Standard costing, which is the system most generally used by those entrepreneurs who have some control over prices, enables them to discover possibilities of importing a certain plasticity into wages costs. The use of standard costs for price-fixing necessitates the setting up of labour standards, and the same standards of efficiency in operation may be used for providing the basis of the payment of wages, by means of an efficiency bonus scheme.

We have already noticed that raw material and semi-manufactured goods purchased and wages of direct labour make up the entrepreneur's concept of prime cost. In each case the costs under these two headings are directly variable, or nearly proportionately variable, with the volume of output. Certainly they are proportionately variable over the probable range of output between certain minimum and maximum amounts which is assumed by the entrepreneur when forming his expectations.

In many industries the cost of plant operation has increased gradually and substantially during the last few years, whilst the cost of direct labour has declined, often at a greater rate. This applies particularly to the newer industries where the methods of production change rapidly and manual work is taken over by machines. Processes have been multiplied and capital deepened to produce articles on a larger scale and at a smaller total cost. Moreover, in some of the newer industries frequent changes are made in the design or shape of the product¹ and these often necessitate the redesigning of machinery. This may be contrasted sharply with the situation in the older industries, such as the woollen industry, in which changes in the methods of production and the design and speed of machinery only take place very slowly. The changes which do take place affect in only small measure the total cost of production, whereas in the newer industries the methods of production may be revolutionized by the redesigning or speeding up of

¹ An assessment of the effects of some of these changes in design and style is made by Burns, *op. cit.*, p. 407.

machinery. In some notable instances costs of production are so altered by revolutionary changes in processes that machinery has to be scrapped and new plant installed at very short intervals.

In those industries in which changes are slow and replacement of machinery only takes place at long intervals, all the costs, other than direct costs which are incurred in the factory, may be suitably described as works oncost, and spread over the products undergoing the various processes by the calculation of a machine hour rate or departmental oncost rate.

But in those cases where plant has to be taken out and redesigned periodically, or where the preliminary costs of setting up machinery for a run or through-put of products is substantial, it is more suitable to distinguish between these costs and those of actually operating the plant. It is amongst these items included by the producer in works oncost, that there is found to be the utmost difficulty in distinguishing the proportion which is variable with output (though not necessarily proportionately variable) and the proportion which is fixed irrespective of changes in volume of output. There is little possibility of making any accurate assessment of the relative proportions without a detailed examination of all the costs which producers usually include under the heading of works oncost.

Plant Operation. That section of works oncost which relates to the operation of the plant, power, repairs and renewals, and wear and tear, is variable to some extent with output. It will not be easy for any entrepreneur to indicate precisely those parts which are variable with output and those which are fixed irrespective of output, without a detailed examination of each item of cost. There are many industries where the costs of operation of plant, power, indirect labour, &c., can be reduced almost in the same proportion as the reduction in output. There are other industries where a reduction in output can be effected by closing a more or less self-contained or complete section of the plant. For example, a woollen mill may be able to close down a weaving shed and start it up again at will. The greater part of the costs of operating that section may be

avoided. In industries where a closing down of a section is technically possible, a significant proportion of the items included in works oncost is avoidable and to that extent that part of cost is prime cost.

A similar result is obtainable by analysing indirect labour, costs of supervision, repairs and renewals, and wear and tear in use of the machinery, as distinguished from loss of value by lapse of time.

Depreciation and Wear and Tear. In the case of industries employing fixed plant and machinery which has a long and useful life, and in which industries no rapid technical changes normally take place, the entrepreneur uses conventional methods for determining the amount to be charged against costs in any particular period of production.

In the older industries particularly, the fixed plant is not often replaced until it has become so old that it is subject to frequent stoppages for repairs and renewals. The usual practice is to include in costs, generally as part of the global figure of works oncost, either a fixed percentage on the original capital cost or a fixed percentage on the diminishing balance of the asset. In either case the intention is to reduce the book value to nil or to scrap value by writing-off a series of instalments each year for a number of years, at the end of which it is expected that it will be necessary to make a replacement.¹

The actual amount imputed to costs when spread over the number of units produced, may or may not be significant according to the amount of fixed machinery used and the volume and value of the product. In any event, of the two conventional methods most in use there is usually only a very slight difference made to costs by adopting one method instead of the other. Their respective merits need not detain us here; nor is there much point in attempting to distinguish between that part of depreciation which is due to a mere effluxion of time, and that which is wear and tear attributable to the volume of output. In few industries only would such a distinction have much interest at the present time.

Of far greater importance is the consideration of obsolescence and premature abandonment. A producer may

¹ See App. III, Q. 40.

decide that machinery is obsolete and replace it for some of the following reasons:

- (a) Because its useful life may be nearing its close and the opportunity may arise to acquire new machinery of the same kind at favourable prices.
- (b) Improvements or inventions may combine into one what were formerly separate processes, or, as is more often the case, processes may be subdivided and two or more machines may take the place of one.
- (c) Rival producers may have recently replaced their plant and it may have become known that operating costs have been reduced thereby. In that event a producer may wish to bring his costs nearer the level of his rivals.
- (d) It may be necessary to replace old machinery which is not capable of producing new types of products, to meet changes which have taken place in consumers' tastes.

Without detailed reports from a very large number of firms it may be somewhat hazardous to generalize by saying that of late years the newer industries, and particularly those which have adopted some form of standardized or mass-production, find it necessary to scrap machinery and replace it a considerable time before it is worn out; it could probably render useful service for many years.¹ In some industries the technique and methods of production undergo exceedingly rapid changes. In particular, the newer products are first manufactured in small numbers by methods which may have become conventional in ancillary trades. The producer himself, and the machine making industry, are continuously experimenting on the design of machinery, with the result that there are periodical changes in design and speed. Moreover, nearly all firms start business in a small way and as they grow they often find it cheaper to scrap a small layout of plant entirely and to set out with an entirely new unit of equipment. In these cases the loss caused by the premature abandonment is imputed to the products produced over one or more production periods. Undoubtedly, if the producer when forming his expectations for a production period ahead, envisages the replace-

¹ See App. III, Q. 41.

ment of certain plant during the production period, he includes some or the whole of it in costs of production. In some instances some average annual rate of cost of replacements may be employed, or occasionally such items may be excluded from costs and the amount written-off from unappropriated profits.

In the case of some large concerns having a large volume of fixed plant it has become usual in recent years for them to appropriate from profit a varying sum each year instead of taking a fixed percentage on the capital cost or on the diminishing balance to cover depreciation and obsolescence as well. This gives the concern the opportunity of reviewing its plant account each year, and in effect re-valuing it at the beginning of each production period, and may enable the annual alteration in value to be calculated more closely. On the other hand, such a policy may lead to an under assessment of the amount of loss in value which has occurred in use in respect of a period when profits are low and the appropriations have to be reduced. Such treatment may affect the basis on which that part of the cost of production is calculated, and in the extreme case wear and tear might be excluded from costs altogether.

It is possible that there may be some confusion about the practice of immediately writing-off the short period plant and the provision to be made in accounts for premature abandonment of fixed machinery. The rapid writing-off of short period plant only applies in those industries where producers have come to regard certain operative or moving parts of the machinery as having the character of loose tools, which are quickly worn out. Certain it is that much short period plant is scrapped before the end of its useful life, but much of it is redesigned and may be used again. It is the general practice of industries now using this sort of plant to treat it at the outset as a rapidly wasting asset, and the producer can gauge fairly well the approximate short period for which it will be used and provide for its replacement at the end of that time. The term 'premature abandonment' might well be used in respect of permanent fixed plant which when purchased is intended and expected to have a long and useful life. Up to the date of purchase technical advance in that industry has usually been slow or fairly well-

defined and never revolutionary. Most industries at some time in their existence have continued for long periods subject to very small changes in methods of production or speed of machinery. Then at some stage in each of many industries there comes a time when some revolutionary change takes place and speed of machinery may be increased significantly, and the costs of production, using old types of machinery, very much out of line with the newer types being used by some firms in the industry. It is in these instances that the necessity of premature abandonment arises. Some industries may be subject to its effects only on one or two occasions in a long history. Others in the last twenty years have been subject to rapid changes every five or ten years, and producers expect or can foresee further changes. It is in these industries that the necessity for premature abandonment of fixed machinery arises.¹

To meet such foreseen changes the producer may set aside a reserve from profits ; in many cases he will include the whole or some proportion of the amount involved in either works oncost or general overhead expenses. The amounts to be provided under this heading in some industries, in the future, may well be considerable.

It may not be out of place to mention here the controversy which often arises about the adequacy or otherwise of allowances for wear and tear and obsolescence in Income Tax computations. It is well known that rates for wear and tear are agreed with various Trade Associations or fixed by the Commissioners, in respect of certain types of fixed plant and machinery. It is generally understood that the allowance which is made in computations in respect of the replacement of obsolete plant covers, in theory, the capital loss which is incurred by the producer. But this is not so in all cases, and there are circumstances in which the figure of notional profit on which Income Tax is assessed, is in excess of the amount which a producer regards as the net figure. The loss entailed by premature abandonment or the scrapping of any plant is only allowable in Income Tax computations in the case where the asset is replaced. If a business closes down and there is a difference between the written-down value of the assets and the price realized on

¹ See App. III, Q. 43.

sale, the resulting difference is obviously a loss arising out of the operations of the company, taken over the whole period of its existence. The profits earned, if any, over the whole period of its existence have been overstated by that amount, and had the correct rates of depreciation, obsolescence and loss in value been foreseen and applied to the writing-down of the assets involved, the profits shown in each of the preceding years would have been much less. It does occur in practice that many items of fixed plant are not replaced, and in that event the producer loses the obsolescence allowance.

Many instances are known where the new plant purchased costs more than the obsolete plant cost on its first being acquired. In that event the allowance for replacements made in Income Tax computations is restricted to the written-down value of the old plant. The cost of the new plant is capitalized and wear and tear rates are applied to it so that the amount of replacement may be recovered ultimately in annual instalments or upon the next replacement. The period of deferment, in some cases, may be a long time. As an example, in a production period a producer may buy a new machine costing £125, to replace one which some five years ago cost £100. The written-down value of the latter for income-tax purposes, assuming wear and tear at 10 per cent per annum on the written-down value, would be £60 and in income-tax computations, assuming the old machine was scrapped and realized nothing on sale, the allowance would be £60. The new asset would be capitalized at £125 and wear and tear rates applied to it, until it would be written-down to a nominal value, if not replaced in the meantime. If a replacement costs less than the old plant, the allowance is an amount which is equivalent to the written-down value or the cost of the replacement, whichever is the less.

In general, producers say that they would prefer to have higher rates of annual allowance for wear and tear, which take into account the fact that machinery is now replaced much oftener than it used to be, so that instead of having a large allowance in the year of replacement, the allowance is spread more evenly over the actual life of the asset. In some cases adjustments of the rates have been made to give

effect to this contention, and it is possible that in the future attempts may be made to calculate obsolescence which can be foreseen, and to increase the annual allowance for wear and tear.

Preliminary Costs of Setting up Machinery, &c. In the engineering and similar industries where mass or standardized production though not as far advanced as in some other countries, is becoming usual, a very large and significant item in a producer's costs is that which falls under the above heading. As previously indicated, machinery capable of forming shapes, sizes, and designs in metal and other materials, needs to be set up and fitted anew whenever there is the smallest alteration in size or shape of the product. In some industries these alterations by custom, changes in consumers' tastes, and the inventiveness of producers, are made at very short intervals, sometimes every one or two years.

The machinery used for these processes is capable of being physically divided into two parts. One part consists of a fixed base or 'stock' which is embedded or securely fixed (in a manner intended to be permanent) to the premises, and is intended to remain in use for a long period of time, which may be fifteen or twenty years or more. This part of the machinery is regarded by producers as fixed capital, in the same way that all machinery of long life is regarded by producers in the older industries. Upon the stock or base is fitted a detachable 'head' which can be removed and another one fitted to the stock in a comparatively short time. These 'heads' are the operative or working part of the machine and these are the parts which may require frequent change. In particular, it may be possible to redesign a working part to alter the speed of operation. In many cases it will be necessary to alter the design of this operative part in many respects whenever there is a change in the shape or weight or design of that part of the product.

In some large factories these heads are removed at very short intervals either for re-setting or re-designing as required, and a separate department is set up in the factory for the purpose. In the case of smaller factories the head may be sent away to machine makers or it may be scrapped

altogether and replaced by a new one. In some factories continuous observation and experiment is undertaken in an endeavour to improve the speed or capacity of the operative part of the machinery, and to reduce dependence on the human element to the minimum. It is understood that the present standard of accuracy of this type of machinery is already more than adequate for all normal purposes, and it is not in this direction that advance is likely to be sought. But speed of operation and additional processing to improve the quality of the product or to reduce labour costs, are the main objectives of producers. In the main the problem is to design simple and faster loading and feeding arrangements to reduce idle or non-operating time. Further improvements are also sought in the removal of processed material.

As production tends to be centred more in the expensive machine-using industries, this element entering into costs of production and the proportion which it comprises of total cost, will be important.

At the present this item of costs is of supreme importance in only a few industries, but in some it may represent as much as 5 per cent to 10 per cent of the total cost of the product.¹ Obviously the cost of supplying, re-designing, and rebuilding short period plant of this kind must be recovered in costs over a very short period. In some industries it is known that its cost is written-off either in the year or season of production in which it is made or purchased, or at most over two or three years to coincide with the life-time of the product for which it is used. In a sense it has very much the same nature as the loose tools and small hand equipment of the older industries. Such implements are subject to rapid wastage and are normally revalued at the end of each production period and the wastage written-off against profit, and of course, included in costs of production. But whereas the survivors amongst loose tools have a value in use, surviving specialized machinery or equipment may still have a long working life but be utterly useless for making a new style of product which is taking the place of one which has been discontinued. When the 'head' of the machinery cannot be re-designed to suit the new product,

¹ See App. III, Q. 39.

and this often happens, its value as scrap is negligible. In these cases the producer includes the whole cost of this kind of plant in his costs for the period or season of production. This special treatment of short period plant shows very clearly the difference between modern and older methods of production, and present and past styles and designs of products. Only a few years ago most machinery then in use was deemed to have a life of fifteen or twenty years. The original capital cost was spread over costs by such an annual charge for wear and tear or depreciation as would reduce its value to nil at the end of its long and useful life. The cost of short period plant to be provided may be a substantial item in total costs; the amount to be included in costs of production in any one period of production will depend upon the expected lifetime of the style or design of product.

The cost of short period plant proposed to be used during the season may be regarded as variable when the budget or output plan is under consideration. In forming his expectations the producer can treat it as such, for in general its amount can be made to vary with the output which is being planned. The proportions of a variety of styles or designs of products decided upon will determine the type and amount of additional short period plant required, the amount on hand which may be continued in use, and the amount to be scrapped. There are a variety of methods of production open to him, and until a decision is made upon the quantity of output expected there are no charges, in respect of that part of plant and machinery, which are actually running against him or are fixed irrespective of his decisions. If the decision was made to produce zero output all the costs of providing short-period plant for making a product would be avoidable.

But once production is decided upon the purchase or manufacture of this machinery is required, and the plant must be set-up in such a form that it will be capable of producing normal output without stress or strain. In this situation a very large proportion of the short period plant and setting-up costs is fixed whatever the scale of output may be. It is clear that to make even a few units of a product all these costs have to be incurred, yet once production is commenced an enormous number of units may pass through

the process without requiring any alteration, and the expenditure of additional costs. The crucial decision is the amount of output which can be expected and for which the plant is about to be set-up. Obviously, the amount of short period plant either required or profitable to use varies with scales of output which may be wide apart. The actual number of processes and the layout can be varied at any time before the setting-up takes place; it is usually difficult to vary either significantly during a period of production, that is after the decision has once been made. There are methods of adjusting costs in other ways which may be open to the producer in some but not in all industries. For example, when dies for a heavy press are prepared and set in position the press is capable of turning out an enormous number of units of product before any further re-setting is required. Therefore, if the producer estimates that twenty thousand units of the product will pass through that press during the period of production, the total setting-up costs when spread over that number of units will be much smaller than if spread over a smaller figure such as ten or fifteen thousand.

If he knew at the beginning of the period that he could not sell the larger number of units of product, he might have laid out his plant differently or purchased the required parts from outside suppliers, or less costly presses might have been used. In a mixed factory a different type of product may be required before the maximum possible run on one type is completed, and the cost of the first setting-up is not covered by the amount budgeted per unit of that product. These 'short settings', as they are called, are an important item of loss in a factory making mixed types of product or different designs of products, particularly where the product is bulky and storage impossible or inconvenient. This is perhaps a partial explanation of the higher cost of some articles mass-produced in this country compared with that of other countries such as the United States. There the home market for most products is very much larger and many things are truly standardized. The volume of throughput of any particular type or design is much greater than is possible in British factories, which are organized on a mixed basis. In Britain the through-put is rarely large enough to

make full use of the output which is technically possible from some specialized machinery. The setting-up costs are spread over a smaller volume of output and the cost of processing each unit passing through that part of the plant is thereby much higher than the 'ideal' cost of products processed in that particular manner.

For the purposes of economic analysis of the short period, and for most purposes, these preliminary costs of setting-up should be regarded as fixed costs once production is in progress. Normally in industries of this type the producer manufactures a significant proportion of the total output of the industry, and only in the exceptional cases of a few industries subject to violent fluctuations, is there any real difficulty in attaining an output closely approximating the budget figure. But as the selling price in these industries is normally fixed in advance and is maintained for a full year or season of production, any deviation of actual from budgeted output is likely to have a serious effect on nett profits. This arises mainly on account of the high proportion of total cost which becomes fixed when production is commenced. If the expected through-put is exceeded profits rise significantly, and conversely, if the actual through-put is lower than the expected through-put profits fall significantly.

These conditions will apply to all industries which make use of large aggregates of short-period machinery. With the technical changes in industry and the shift to machine production, the importance of long straight runs of through-put will increase. The organization of such industries will require close attention if they continue their policy of providing mixed types of product in the same factory, for the proportion in which these mixed products are sold and the arrangements made in respect of delivery dates, often determine the extent of 'short settings' and add appreciably to the difficulty of budgeting in an output plan.

Establishment and General Expenses. In most industries this part of production cost is only a small proportion of the total cost of the finished product. It embraces such items as rent, rates, salaries, office, and administrative expenses. Sometimes normal selling costs, that is the amount usually

expended on travellers' salaries and commissions, advertising, printing catalogues, &c., are included, though where the channels through which the goods are sold are such that this item of expense is a significant part of the total expenses, they may be separately computed. Some very large producers expend only 5 per cent or less of their total costs on the above items. The exact proportion differs widely, mainly dependent upon whether the product is an old or a new one and the unit value. In general, the proportion is small compared with prime costs and cost of operation of plant. In deciding the scale of output the producer does not attach much weight to the amount of his establishment charges.

Costs of Production. The items comprised in prime cost, works oncost, and overhead costs or office costs, make up the total costs of production. When the term is used by a producer it does not include any margin for profit. For the purposes of economic analysis the concept of costs of production often includes an addition for the usual or normal rate of profit which an entrepreneur expects to earn, and the non-receipt of which may cause him to cease to function as a producer. Such a concept has proved very useful in economic analysis, but it must not be confused with the entrepreneur's concept of the same name. If an entrepreneur is asked whether or not in certain circumstances he will reduce his selling price below costs of production, he will have in mind the idea of selling at a loss; that is, below the actual out-of-pocket payments for costs. Obviously, this is a very different result than that which would follow upon a reduction of selling price below costs of production which included profit in the concept. In that case the action might result only in a reduction of profit below that normally obtained, and not necessarily in an actual loss. This is obviously very different from deliberately deciding to pay away more in expenses than the amount received on sale of the product. The producer himself makes a clear-cut distinction between actual computed costs of production and the surplus or residue expected or realized on the sale of the product.

It is interesting to observe that in the Fourth Report of the Select Committee on National Expenditure, the producer's concept of costs of production has been adopted,

and profits are not included in costs, not even that part of profit which is normal and which may be expected and required to keep the entrepreneur in business.¹

Interest on Capital. There is no settled practice amongst firms in connection with the treatment of interest on capital employed in the business. Some firms include interest on the fixed capital employed in all processes, and a few occasionally add interest on floating capital in respect of raw materials kept in stock.

It is quite usual in many industries to include interest in computing machine hour rates. Without a detailed examination of costs it is not possible to discover whether interest is or is not included in the costs of production of any particular product.

In the Scheme of Cost Investigation recently agreed between various Government Supply Departments and the National Internal Combustion Engine Manufacturers' Association, there does not appear to be any provision for including interest on capital as part of costs of production. It is not mentioned specifically, but as the costing has to be reconciled with the annual Profit and Loss Account it seems clear that it is contemplated that producers shall be unable to include in cost any charge for interest on the capital employed in production. As this scheme applies to Government contracts in which there is a term to the effect that the contract price shall be a reasonable price to be mutually agreed, having regard to costs, it might have been expected that interest would be included to give effect to the different capital structure of the firms concerned. On the other hand, it might make the comparison of costs more difficult.

For normal pricing purposes the inclusion of interest on capital in costs is extremely useful, particularly when processes are effected by very expensive items of plant. The interest charge may be a substantial proportion of the machine process, and may be a consideration in the decision to use that process, or some other, which may require a larger or smaller capital outlay.

Where this comparison is not required there is not much point in applying interest rates, and in all those cases where

¹ Select Committee, 4th Report Part II, 11, 'Costs and Costings'.

the cost of capital involved in processes does not vary significantly between one machine and another, an interest charge is not usually included in costs by the producer.

The Plasticity of Costs. Discussions with business men supported substantially by the answers to the questionnaire,¹ suggest that in some industries, particularly the newer industries, there are many opportunities of varying costs by conducting research into processes and machine operations. The cost conditions of industries fall into two main classes:

- (1) Industries which may be called the older industries, where the rate of technical advance has seemed, for all practical purposes, to tend to zero; and
- (2) The newer industries where methods of production and machine operation change rapidly and are deemed to be capable of alteration or improvement.

The older industries, such as the woollen and worsted industries and cotton industry, have to some extent settled down to a routine or method of production which does not change very much over a number of years. In these industries the costs of production incurred by an individual firm cannot be varied significantly during a season of production by methods which are open to the newer industries. Whilst the making up of a budget or output plan in respect of costs is easier in the older industries, should any significant alteration in cost of raw material or rates of wages increase the total cost, there is no opportunity of off-setting this increase by changes in methods of production. Inevitably, as will be noticed later, such changes in cost are, subject to the conditions of demand, fairly quickly translated into increased prices quoted for future deliveries. It is also noteworthy that in such industries where methods of production do not change rapidly, the industries are usually many-firm industries, and it is rare to find one in which one or a very few firms control a significant proportion of total output. In the newer and rapidly developing industries, such as the motor industry and those making use of mass-production methods or expensive machine processes, there seems to be great opportunity for adjusting costs by rearranging processes and methods of production. It is in many of these

¹ See App. III, Q. 31.

industries that we find selling prices rigidly fixed for a season of production, and in these cases it seems obvious that a producer must have some method or opportunity of smoothing out costs and minimizing the deviations of actual costs from standard or expected costs. If deviations are observed in respect of any item of costs or expense of processing, research is undertaken immediately into some of the processes which offer the prospect of a reduction in cost. The methods adopted in practice vary according to the nature of the processes, but often take one of the following forms:

(a) Omitting some unnecessary process or operation. Many of the processes may have remained unaltered for some time and a detailed examination may show the possibility of omitting some minor process which is not essential to the quality or finishing of the product. Such a process under the methods of production for which it was designed may have become usual and not have been subject to review for some little time. It is only when special attention is drawn to some change in costs that a review will appear necessary, and will be undertaken. Many entrepreneurs state that all processes are reviewed from time to time, but the problem is always more thoroughly explored in response to some stimulus.

(b) Investigation often shows that one or more processes are capable of being divided and more conveniently arranged for speed or flow of production. This may always be under review but does not receive the same attention as it does when bottle-necks have appeared, and need to be overcome to maintain the flow of production.

(c) In case of necessity during a season of production, the possibility of speeding up the machinery or the operators may be explored and may be adopted, if only as a temporary arrangement to smooth out advances in costs of other or the same operations. This is not possible in a number of industries where the limits of technical advance may have been achieved. But there is still scope for improvement in feeding and loading arrangements.

(d) In many industries it is possible to smooth out costs by omitting part of or reducing the quantity of the raw material incorporated in the product. This will apply to those industries where a small variation in the quantity of

one or two expensive ingredients will show a substantial saving in cost. It will not normally be undertaken by firms, but only in cases where the price of the product cannot be altered for some time and it is necessary meantime to smooth out total cost to bring it into closer conformity with the standard cost.

(e) Producers are at all times active in tightening control to reduce waste of raw material in cutting and shaping, and to minimize the amount of spoilt work at various stages of the processing. It is often the case that many firms, when stimulated to increase such activities by the knowledge that costs are diverging from the standard, often find that increased savings are possible. The costs of more strict and rigid control may be substantially less than the savings effected by the elimination of waste.

(f) As a last resort some firms may be able to alter piece work rates of wages or efficiency bonus payable, but unless processes are subdivided or some rearrangement of methods of production is undertaken, such changes would meet with resistance and are not generally used or regarded as useful for smoothing out costs.

(g) Sometimes the firm itself designs new and faster machinery to replace machinery which is causing some bottle-neck in the flow of production, and by reason of which costs may have increased. Obviously the possibilities are limited in the case of some industries, but in others the methods of production may be such that given the stimulus, efforts will be centred on this aspect of production.

(h) There are periods of production in which some producers find that their actual costs, upon a test being made, are found to be lower than the standard costs assumed for the purposes of the budget. In that event the policy may be to add to the quality, processing or finishing of the product. But in general such savings are added to profit.

VI

MARGINAL COSTS

General. In the conventional analysis of the equilibrium of the firm¹ one necessary condition is that the output produced is an amount the marginal cost of which is equal to the marginal revenue. It will be interesting, therefore, to consider whether or not the producer has any knowledge of such a precise concept, and if he has, whether he uses it explicitly in deciding the price at which he will sell the output which he proposes to produce. If he has no knowledge of the concept as such, but uses other methods, is it possible that they lead implicitly to this necessary condition of equilibrium? The answers to these questions will be of the utmost assistance in assessing the value either of the conventional analysis itself or of proposed modifications.

All the indications are to the effect that of the large number of producers which goes to make up British industry very few indeed have any knowledge of economic concepts and the term 'marginal' cost does not convey any meaning to them.² Certainly there are a few large producers who have in their employ persons with training in economics, and occasionally one does meet an instance of the meaning being understood and the term actually applied and used in the conduct of the business. But such a situation is exceedingly rare, for such employees are not normally charged with the direction of price policy.

Nearly all producers are aware that included in the total cost of production there is almost always some one or more elements of cost which are fixed or not variable proportionately with the volume of output. This is, of course, the substance of the concept of marginal cost. It may be correctly described as the addition to total cost occasioned by the expansion of output by the production of an additional unit of product. Obviously if this additional amount is different from average costs there must be some item used in the computation of the average cost per unit, which does

¹ J. Robinson and E. H. Chamberlin, *op. cit.*

² R. L. Hall and C. J. Hitch, *op. cit.*

not change in direct proportion to the change in the volume of output. Knowledge of this fact is clearly before the producer when he is forming his expectations. Such awareness need not take the precise form of computing the actual marginal cost, though this is quite common and presents no unusual difficulties at some stages of output. It may take the form of comparing average costs at different scales of output, which giving weight to the fixed item in the total costs, fall as output is increased from zero onwards up to 'normal' or sometimes up to a comfortable maximum output. Awareness of the fixed element in total costs usually takes this form in small and medium sized manufacturing enterprises where only the smallest attention is given to cost control and the formulation of production plans. In the larger enterprises definite calculations are often made of the additional cost of producing further units of the product beyond a certain minimum output, if only as a check upon the fixed and variable elements in costs.

It proved difficult to draw a question to bring out information about marginal costs from entrepreneurs. Discussions with many business men confirmed that to use the term would be useless as few entrepreneurs would be able even to guess what it meant. It was decided to present the question in a form as practical as possible, but yet having some regard to the precise nature of the concept. Very few answers to the question (33) show that its importance has been grasped by those who have replied to it. This may be partly because a little extra output, say something of the order of 5 per cent above normal, does not convey very much to an entrepreneur. His output may vary by 10 per cent or 15 per cent above or below normal, and the marginal cost may not vary significantly over that range of output. Of the replies the large majority show that if output is increased by about 5 per cent, the only additional cost incurred is that in respect of direct labour and material only. Some have marked their answers 'no extra cost' and others 'direct labour and material only alter and these proportionately', which is interpreted as meaning that within that range of output their marginal cost does not change.

If the entrepreneur distinguishes between fixed and variable costs, he uses his knowledge on two distinct

occasions and for two special purposes, which are of importance in his price policy:

- (a) When forming his expectations upon the preparation of the budget or output plan; and
- (b) during the course of the production period.

In the first place he applies the weight he gives to the relative importance of these two sections of his costs, in deciding the output he will attempt to achieve and the method, being one of a variety of methods available of achieving it. Secondly, once the decision has been made he uses every endeavour, as shown previously, to effect any adjustments which may be required, and which may be possible, during the period of production so that the actual costs are kept closely to expected costs.

As it is amongst the variable costs alone that elements are to be found which cause changes in marginal costs, it is proposed to examine them in detail to discover in what way they usually vary.

Discussions with entrepreneurs confirm that marginal cost varies with output in a regular pattern:

- (1) It may be assumed to fall at first from zero output, until a certain minimum output has been reached. For scales of output wide apart different buying prices of raw material and division of labour and processes are possible. In practice the choice of scale for any one production period is fixed between limits not very wide apart. It is rarely necessary to consider outputs very much below 'normal'.
- (2) There is a range of output starting from a point as much as 10 per cent or 15 per cent below 'normal' output to a point as much above 'normal' output, over which marginal cost is fairly constant. The lower point is regarded as a minimum volume of output below which marginal cost would rise rapidly if production were continued with the same layout of plant and the same division of labour as that assumed for the purposes of the budget or output plan. The point above 'normal' output may be regarded as the comfortable maximum output which can be reached without stress or strain upon the plant and labour employed.

- (3) Marginal costs rise (sometimes very rapidly) as output exceeds the comfortable maximum working capacity of the plant and equipment and the labour employed.

We observe from the questionnaire that industries vary very much in the range over which 'marginal cost can be assumed to be falling, is actually constant, or begins to rise again. If those replying to the questionnaire have fully apprehended the significance of the relevant questions, there are one or two cases where a fall in output of 5 per cent or 10 per cent below 'normal' would cause marginal cost to rise sharply with the same type (not amount) of specialized equipment or lay-out that is normally used. In other cases the percentage variation, without change in marginal cost, is much higher.¹

Falling Marginal Cost. If marginal cost is falling, as it normally does from zero output to an output which is 10 per cent or 15 per cent below that normally produced, it will be on account of one of the following:

(a) Reductions in the unit cost of raw materials and semi-manufactured products. It is customary for special discounts to be given in respect of purchases of large quantities of material when taken in large lots or by firm contracts over fixed periods. Obviously, the larger the amount of purchases made by a firm in a certain period, the more desirable does it become as a customer of firms producing raw materials or semi-manufactured goods. In fact, the savings to a large firm under this heading are considerable and the larger the buying the greater the bargaining strength. Additionally, when large quantities of material are involved there may be less waste in processing, cutting, shaping, or stamping, and there may be opportunities of utilizing products which would normally be waste. Again, there are savings on carriage and cartage in very large quantities.

At a certain level of output the limit of economies under this heading is reached, and any additional units purchased cost about the same as the previous bulk. Large scale buying and the placing of firm contracts is much more important in some industries than others where large and

¹ See App. III, Q. 13.

small buyers may be able to purchase at or about the same price, but in general the cost varies significantly with the quantity, up to a certain point.

(b) *Labour Cost.* Labour often becomes more efficient as output is expanded, if there is an even flow of work and operatives are working for the full normal time. There is no tendency to restrict effort as there may be when there is not much work in sight. This is not intended to imply any culpable neglect to put forth the normal efforts employees are expected to make, but to reflect a tendency which often appears in a factory when there is no stock of material to be processed being pressed forward. If the technical conditions of operation are such that it is inadvisable to close down the whole or a section of the plant for short periods of time, then the marginal cost under this heading always begins to rise with a fall in output. Many operatives will be continued in employment and may be receiving the same rate of time wages for the reduced output.

The most important reason why labour cost decreases as output expands from zero onwards, is because greater division of labour becomes possible and more specialized processes can be designed and put into use. When there is an even flow of work skill and efficiency of operatives are put to fuller use as output expands from a subnormal output for the plant towards the minimum output for which it was designed. Marginal costs in respect of wages of labour are falling over this range.

(c) *Plant Cost.* As we have seen, a large part of this cost is variable proportionately with output when forming expectations, but when production is commenced it is for all practical purposes, fixed cost. Variations in some part of the plant cost, on account of changes in output, once production has commenced may be possible but are small compared with the total outlay. Below the minimum output for which the budget is prepared, it is certain that all the equipment provided would not be required or would not have been laid out for the smaller output. Therefore, the cost of producing a much lower volume of output cannot fairly be computed on the basis that such a lay-out of plant would have been available. It would either not be needed for a small-scale output of that product, or a different method

of production or division of labour would be arranged, or the product itself would be different. Where there is a very wide gap between two scales of output, it is usually unnecessary to analyse the entrepreneur's conduct on the basis that he would use the given plant and equipment for scales of output so wide apart. He does not normally find it necessary to consider variations other than a percentage above and below normal.

There would, obviously, be less deepening of capital and fewer round-about processes if the scale of output were very much less than that which is normally undertaken by that producer. If the output were very much larger, the processing and operations would be laid out differently. In one year or season of production the possible adjustments are limited, and output from that factory, laid out as it is, could not possibly exceed a certain maximum envisaged in the production plan.

We cannot assume that a curve of expected marginal costs for a period of production is continuous over the whole range of output from zero output, passing through 'normal' output to a large excess above normal, without doing violence to the practical aspects of production.

A new curve is required for each year or period of production to express proposed major changes in lay-out and equipment, and to show possibilities for outputs below the minimum. Another curve is required to show outputs above the maximum output. To express the situation geometrically, these curves may be connected by an envelope,¹ but this would blur the practical issues involved in passing from one scale of production to another substantially different. To produce on a scale which requires a different lay-out of plant and machinery entirely different marginal costs would be incurred. Adjustments (within limits) are possible during the period of production, but to proceed backwards or forwards over ranges of output very wide apart could not be effected along a smooth curve. There are, in some industries, kinks in the curve, and these are likely to occur just below the minimum output assumed for the plan and just above the 'comfortable maximum'. At

¹ R. F. Harrod, 'Doctrines of Imperfect Competition', *Quarterly Journal of Economics*, 1933-4, p. 451.

these scales of output different methods of production would have to be considered. Alterations could not proceed smoothly to produce just that amount of output required.

For the analysis of the particular period of production we can only be certain about that part of the curve which is relevant to the entrepreneur's decisions, that is, a range which covers the normal output assumed and the minimum point below, and the maximum point above it. The entrepreneur has chosen (in effect) the marginal cost curve which appears to him most suitable for the methods of production which are open to him with the nucleus equipment and additions or alterations open to him at the beginning of, and during the period of production, in respect of the volume of output he expects to produce.

Constant Marginal Cost. In general, for all producers of manufactured products it seems that marginal cost is fairly constant over the range of output about which it is normally expected to use the given equipment on hand at the beginning of the production period.¹ At some minimum output slightly below normal, all the economies which are possible by bulk purchasing of raw materials and division of labour are maximized in respect of that plant and lay-out. If at the beginning of, or during the period of production a producer intends to alter the processes and division of labour or to make more advantageous contracts, in so far as they are foreseen, they are incorporated in the budget or output plan. After allowance has been made for these adjustments the marginal cost is computed, and for the purposes of the budget the expected marginal costs are constant over the range of output about which it is intended to produce.

In this event the only addition to or subtraction from the total cost of normal output by producing a little more or a little less output, is a proportion of the costs incurred under the heading of (a) material, and (b) labour. At the 'normal' volume of production and over a range of output, all the possible savings in cost of raw material and arrangements for payments of wages and division of labour have been

¹ This is the assumption often made for the purposes of theoretical analysis for all scales of output. As here shown it applies over a fairly well defined section of the cost curve only and not necessarily over the whole of it.

made, and such costs over the range of output are variable in direct proportion with the output.

It is no mere chance which accounts for marginal costs being constant over the range of output at which the producer normally works his equipment. It follows from the method adopted by entrepreneurs of assuming a 'normal' output for the purposes of their plans. The lay-out of equipment and the methods of processing are arranged on the basis that they are the most effective known or available for that period of production to produce the normal output of the product. This normal output may be called 100 per cent production. If the actual output falls, so that when computed at the end of the period or season of production it is found to have been (say) 85 per cent of the normal output assumed for the plan and expected, no changes will have taken place on that account in costs of raw materials, semi-manufactured goods, and direct labour. Contracts are arranged for certain minimum and maximum amounts of materials and semi-manufactured goods to be taken as required over the period at a fixed price. Exact amounts are sometimes specified, but dependent on the nature of the product and the industry, there are usually clauses in contracts to provide for some variation in the total amount supplied in a period without changes in price.

For example, if a contract is made to buy over a certain period (and it must be remembered there is a regular course of dealing between the parties so that transactions are taking place continuously over a series of years) 1,000,000 small parts at 40s. per 1,000, no lower price could be obtained by ordering 1,150,000. Similarly the seller would still sell them at 40s. per 1,000 if only 850,000 were taken in the one period of production. This is particularly the case where the supplier may expect a regular course of dealing over a series of years about a normal figure of 1,000,000. His plant is laid out for a 'normal' output and it is resilient within a similar range and his marginal costs do not vary, or vary very little, over that range.

In this respect nearly all industries work according to the same methods. Obviously, practically all plant and machinery has a certain 'resilience' about the 'normal' output of which it is capable, and over a range raw materials and

wages costs vary in direct proportion to output. The amount of material is proportionately variable and its price per unit does not change over that range. The number of employees can be varied within those limits, because one or a few machines can be put into reserve, repaired or cleaned when output drops a little (say up to 10 per cent or 15 per cent below normal as above mentioned). Similarly if extra output is required up to 10 per cent or 15 per cent above normal, extra materials are bought at the same unit cost as for a normal output, and the reserve machines can be brought into use and additional employees engaged.

It is actually possible to determine within very close limits, the margin of 'resilience' in any plant. Rearrangements and adjustments during the season of production are possible within these limits. There is no doubt that over the range indicated in the example given, marginal cost is constant for most industries.

The situation would be entirely different if output fell to a point 25 per cent or 33 $\frac{1}{3}$ per cent below normal expected output. Suppliers would object to cancellation of some deliveries and damages or differences may have to be paid, or the goods taken into stock or stored. Therefore, when contracts are made for certain variations in quantities, there are limits, lower and upper which cannot be exceeded without the buyer being called upon in one way or another to pay an extra cost per unit (often the contract makes specific provision for this). Further, if contracts are proposed at the beginning of a season, for supplies as much as 25 per cent or 33 $\frac{1}{3}$ per cent below normal output of previous years, the supplier's marginal costs rise as he may be compelled to reduce his scale of output. The price quoted for 700,000 articles (remembering the course of dealing and the variation of 10 per cent or 15 per cent usually allowed in quantities taken) may be 42s. per 1,000 as against 40s. per 1,000 if 1,000,000 are contracted for. This explains also the statement that all economies have been effected at the minimum point below normal output. Requirements of 85 per cent, 100 per cent, or 115 per cent of 'normal' are scales of production close enough in some industries for materials required to be obtained at the same prices, for quantities not very wide apart. Obviously, bulk buying prices vary by

leaps as the quantity increases, on account of savings on delivery and other similar costs. Suppliers make big cuts in their profit margins for bulk orders. If double or half the usual or normal purchases were made, the scale of output of suppliers would be changed too and prices would be different at every stage of production, i.e. in all the inter-connected industries. But such a situation rarely occurs and within limits similar to those observed and mentioned above, there is a range of output in all industries over which marginal costs are expected to be constant.

Rising Marginal Costs. If output is pressed beyond the amount which is normal with the existing plant and equipment (after allowing for any possible rearrangements during the period of production) marginal costs begin to rise, and in many industries they rise sharply. The normal output which a producer expects to achieve when preparing his output plan, is usually a good deal below the maximum capacity of the plant. The concept of maximum capacity is usually that of an ideal output which could be achieved if it were possible in practice to drive the machinery at full speed and without any allowance for standing time required to make adjustments, tuning up or inspection. Very few producers would ever budget for such an ideal state of affairs. There is obviously a comfortable, even working pace which may possibly be kept up for long periods without stress or strain, and as a result there may be kept up an even flow of raw material to finished product. If it were possible to keep all the plant in use for a full working year, to drive it at full speed and without keeping any in reserve for overhaul and re-fitting, output could be increased beyond the normal amount assumed for the purposes of the budget. But any attempt to carry on production at this pace usually results in disturbances which are costly and may even reduce the output, for a time, below normal. If some over-driven machinery breaks down and there is none in reserve, bottlenecks may appear in the processes of production, and the balance of the plant may be disturbed. The failure of one or more machines, if there are none or an insufficient number in reserve, may upset the whole flow of production. Further, there may be a rising percentage of spoilt work at one or

more stages of production. There may be difficulty in loading and moving goods and they may back up in the section of the factory which is out of action. A whole factory may quite easily get out of gear, for nothing so disturbs the flow of production as a lack of harmony and balance in the plant.

When rising marginal costs are being considered it should be stressed that it is not only the *additional* units which are likely to cost more per unit than they would cost if the factory were working under normal conditions. All the units undergoing the processes where machinery is being stressed will cost more than they would have done normally. It is the machine or process which is out of gear. In practice, marginal cost is this total extra cost incurred (divided over the number of extra units) and not only the extra cost of labour and materials involved in producing the extra output. It is the addition to total cost (of any kind, and however incurred) which is occasioned by the production of the additional units. This makes clearer the reason for the rapidity with which marginal costs actually rise, in practice, when extra output is forced beyond the comfortable maximum capacity of the plant and physical capabilities of the operatives. All entrepreneurs are aware of the effects of 'forcing the plant'.

Therefore, in the case where a producer assumes, for the purposes of his budget, that he will achieve the maximum production, it is certain that in deciding upon the amount of this maximum, allowance is made for all the events which take place in the course of a year's production, and he is not assuming an ideal output, but one which in practice can be achieved.

When the range of output over which marginal cost is constant is passed, marginal costs begin to rise rapidly on account of the following:

(a) *Stressing of the Plant.* As pointed out above, this is certainly the most important cause of the rise in marginal cost. Even if it is possible to force more than normal output by working extra time, the strain on the plant soon begins to show itself and costs rise more than in proportion to the additional output.

(b) *Labour.* Any expansion of output beyond normal

requires either overtime or night shift work. Overtime usually means, in most industries, an increase in wages rates, which in themselves increase marginal costs, or the output during the additional hours worked falls below normal and the cost of processing rises. It is found that during the normal working week output rises and falls on different days of the week, and the longer the overtime hours worked the lower falls the average hourly rate of output during overtime. Overtime is not generally in favour for these reasons. In those industries where night shift working is usual on account of the operations or processes being continuous, night working is normal and is included in the budget costs of production, and a consideration of its effect on cost does not arise in analysing the effects of pressing output beyond normal. In such an industry there is little possibility of increasing output, for extra time cannot be worked if the processes are continuous for every hour in the year.

In those industries where it is usual to work a certain number of hours per day and then to close the main part of the factory, night shifts are occasionally used in some sections to force extra output or to perform work which cannot be done whilst the rest of the factory is in operation at full pressure. In these industries it is always found that not only is the hourly rate of wages, agreed with employees or their trades unions, higher than for day work, but other special allowances have to be made by way of paying wages for more hours than those worked. Further, the average output of operatives working at night is always substantially below that of a day shift engaged upon similar operations.

(c) *Materials.* It is a very rare occurrence for marginal costs to rise because larger amounts of raw materials and semi-manufactured goods are required. Generally increased quantities are available at the same rate per unit as the quantities already bought on contract, or reductions may even be possible. But in a rare case where only one or two specialist firms are supplying parts, their marginal costs may rise if they are called on to produce more than their normal output, and they may refuse to supply urgently unless a higher price is offered by the producer whose expanding output calls for the additional supplies.

It is certain then that with the existing lay-out of equipment any attempt to force output beyond a certain comfortable rate of operation involves rapidly increasing marginal costs. In normal circumstances producers are not called upon to press output much beyond normal. In fact the general case is that the normal output assumed when forming expectations, is below the output which could be achieved without stressing the plant and thereby incurring increasing marginal costs. There is usually a small amount of plant kept in reserve to meet emergencies, or ample allowance is made for idle time for overhauling and renewing where necessary.

It is possible that in many industries over a series of years, the amount of output may swing between the minimum and maximum points which the producer assumes for the purposes of his plan. It may fall as far as 10 per cent or 15 per cent below normal and may increase by a similar amount without any alteration in marginal costs. Outside these two limits marginal cost will rise for a fall in output and will rise for an increase in output. In each case when the alteration in output appears likely to persist, a reorganization of the plant and processes is necessary and is usually undertaken.

Purposes for which Calculation of Marginal Costs is used. It has been shown that marginal costs are considered explicitly as part of some producers' (mainly price-fixing firms) output plans. In many instances a recognition of the actual marginal cost is not imported into the decision upon the actual price which is fixed for the product. Rather is the consideration of marginal cost of importance in determining the output which shall be assumed as normal for the purposes of the output plan. The producer always assumes an output range over which marginal costs are constant. If marginal costs are falling for small increases in output, then the producer has not laid out his plant and is not employing labour to the best possible advantage. If marginal costs are rising, the producer is stressing the plant and labour force at his command, and would avoid both by altering the lay-out or installing additional plant or subdividing processes and labour operations for the purpose of planning the output for the period. It is certain that when formulating his plans

he assumes the best normal arrangements possible with the existing equipment and labour available. Changes in, or rearrangements of lay-out which may be possible at the beginning of or during the season of production, are taken into account. But for the purposes of the plan he would not assume an arrangement which was not the most suitable known at the time. It is upon the basis of expected costs, using this lay-out and assuming a normal output, that prices are fixed, and not upon the actual costs which may be incurred in the period. Therefore, if calculations are made of marginal cost to form a basis upon which his expectations are to be formed, the lay-out adopted for the plan will be one where all possible economies appear to have been achieved. The relevant range of output upon which the producer bases his plan may be wide or narrow but it is always one over which expected marginal costs appear to be constant.

Some entrepreneurs who are in a position to fix discriminating prices for different parts of their output, utilize their calculations of marginal cost for this purpose.¹ They do not use this term but may call it 'variable cost', 'bare cost', or some other term. They usually proceed as follows. It is assumed that at a certain price, certain products will make a contribution to the covering of the fixed costs and a margin for profit. The proportion of the contribution required from one product is spread over the assumed output of that product, and often a much smaller proportion or in some extreme cases nothing at all, is assumed from another section of the output. Thus the price of the product in the home market may be fixed at £100 on a certain output, and for export at £90. The actual average cost of the product may be higher in some cases than the selling price fixed in the lower price market. A price policy such as this is often utilized, particularly by manufacturers of a diverse range of products. Some products may contribute a large proportion of the fixed costs and others none at all. The correct calculation of marginal cost if not explicitly is implicitly undertaken in the procedure adopted by producers who adopt such a price policy. Even the smaller producers who do not calculate costs with any attempt at precision, are

¹ As to discriminating prices generally, see Burns, *op. cit.* chap. vi.

aware that once production of an article has been commenced, some proportion of their costs are fixed and that if output is increased these costs will not have to be incurred again. Such producers often are prepared to accept an order at a discriminating price which is lower than the average costs of production plus profit on the assumption of a normal output. With the reserve output capacity they have in hand they may be able to execute a few additional orders and to gain introductions to new customers. They use their knowledge of fixed and variable costs to quote discriminating prices.

There is little doubt that throughout all sections of British industry there is knowledge amongst producers of a concept which closely approximates that of marginal cost as described and used by the economist.

VII

PROFITS AND DIVIDENDS

Profit. The difference between actual selling price of the output of a producer and the actual cost laid out in producing the product, is profit.¹ As there is often some uncertainty about the computation of the actual cost of a product, so also there may be a like uncertainty about the items entering into the composition of profit. For example, in comparing the profits of a public and private limited company it is necessary to ascertain whether in each case the earnings of organization and management are or are not included in costs, are separately stated or are part of the item termed profits. In the case of a public company it is usual to charge up in the profit and loss account the remuneration of managing directors and managers, before striking the balance which is nett profit. In most cases the earnings of management will be included in the item of establishment charges or overhead costs, and spread thinly over some or all of the products of the enterprise, as part of imputed cost. In other instances it is known that the item is excluded from costs and regarded as part of the divisible profit.

In the case of a private company (as defined by the Companies Acts) in which the management and organization of the concern is in the hands of the majority shareholders who assume the risks of the business, the situation is very different. The nett profit is often struck before settling remuneration of directors. It is then divided in agreed way between remuneration of management and dividends on ordinary shares. The division agreed upon often be made in order to obtain relief from Income-tax and Sur-Tax by the individuals who are members of company. Upon the portion of profit attributed to shareholders the individual recipient is granted an earned income allowance. The effect of some of these arrangements will be discussed under the heading of 'Dividend policy'. Here it is to be observed that this method of computing a private

¹ Select Committee, 4th Report, Part II, iv, par. 13.

company's profits, means that the amount added on to costs of production in respect of profit margin, may also include the earnings of organization and management.

The position is similar in the case of a partnership. In this case the profits are struck, in most cases, before any allowance is made for the earnings of management of the partners.

A producer normally expects to earn, by reason of his productive operations, a surplus or residue in each period of production, which is often a year. This surplus is required to provide:

- (a) a return on the capital invested; and
- (b) a reward for the risks to which the capital is exposed.

In the case of a limited company, whether public or private, part of the capital invested is often subject to some special priority of claim in respect of annual interest or part of profit and repayment of capital, or both. In these cases the element of the risk of the loss of either capital or income may be at a minimum and the annual return thereon may be small compared with the total normal profits of the company.

The balance of profit after meeting these prior charges is in whole, or in part, the reward for the risk undertaken by the holders of the equity shares, usually denominated ordinary or deferred shares or stock.

The resulting item of nett profit available for rewarding the risk bearers is susceptible of closer analysis. If the risk factor can be ascertained with a fair degree of approximation there may be distinguishable an element of pure profit or super profit, in the annual surplus of some concerns. This point may be further developed when the ascertainment of average risks to which capital is exposed in any industry, or as an average of all industries, can be calculated. The most suitable and useful measure would be one common to all for each separate industry.

This element of pure profit or super profit emerges from the dominant position attained by some firms compared with others in that industry. If an average rate of return on capital invested is regarded as sufficient to cover the risk factor, then all the surplus is pure profit and arises from the special advantages enjoyed by that company compared with other concerns in the industry. No attempt has yet been

made to calculate in respect of certain companies the amount of normal pure profit which they can expect in any given year. But an examination of some of the prospectuses issued shows that the amount to be paid to the vendors of businesses for goodwill is often determined mainly by reference to the amount of super profits, as they have been called, which can be expected from the normal working of the business.

A clear distinction must be made between the rate of profit expected when plans are being prepared, and the rate actually achieved in any period of production. It is the expected rate of profit which is added on to cost for the purpose of fixing prices, and not the actual rate of profit achieved during the period. The actual results may, and often do, differ from expectations, dependent upon the actual output sold, and in smaller degree upon the time lag between observed changes in costs and the date at which prices can be altered to reflect the change. In those industries where by custom it is usual to alter prices upon the shortest notice, the expected rate of profit may be more nearly achieved by altering prices from time to time. In those cases where it is usual to fix a price for a definite period, or in such wise that it can only be changed on giving long notice, then the actual profit earned may often differ from the expected rate assumed in the plan.

In assessing the risk factor which determines the percentage or amount which is expected as profit, the following factors are given weight in the producer's plans:

- (a) the average deviation which may be expected between the output actually produced and sold and that assumed for the purpose of computing costs and profit. That is, the risk of having over-estimated the demand for the product;
- (b) an average over a few years of the sum of the deviations of actual from standard costs.

The latter is not only dependent on the actual output which may be achieved compared with the amount which is budgeted, but also upon unforeseen changes in wages rates and costs of raw material, or efficiency of plant and operatives. If the effect upon nett profits of (a) and (b) taken together, is expected to increase or decrease during the

forthcoming period, the profit margin which has been usually added may be raised or lowered.

The expected profit which is added to cost price to provide the selling price of a product is usually calculated in one of the following ways:¹

- (a) a fixed percentage on cost is added in respect of each separate product.
- (b) a different percentage is added to cost according to the type of product, where several are produced. The actual percentage used may be dependent upon:
 - (1) The price-class into which the article falls.
 - (2) The extent to which the product is differentiated from similar products produced by other firms.
 - (3) The nature and extent of competition in respect of each article.
- (c) Occasionally a global figure of expected profit for a period of production is divided over the total number of articles expected to be produced. If this method is used the global figure of profit may be compounded of some expected percentage return upon the capital employed in the manufacture of the product.

The answers to the questionnaire show that the first two methods are usually adopted and that expected profit, whatever may be its relation to the capital structure of the enterprise, is so related implicitly and not explicitly by the producer when making his decisions.²

In the Fourth Report of the Select Committee on National Expenditure, attention is drawn to the fact that it is the custom of many business men to measure profit by reference to total cost, and they interpret the term profit as 'profit expressed as a percentage of the costs of production'. The Committee find difficulty in relating profits to the capital invested or in applying a fixed rate to cover fair remuneration for the use of capital and the efficiency of skilled supervision. Undoubtedly it is the reward obtainable by efficient organization and management of the productive processes and selling arrangements which in part determines the actual percentage of profit which can be added to costs.

Of the alternative methods which may be used for deciding upon the percentage of profit which may be added to

¹ Select Committee 4th Report, Part II, iv, par. 14. ² See App. III, Qq. 4 and 9.

cost in fixing the selling price, the method first described, that of adding a fixed percentage on each line or type, is used in the following circumstances:

- (a) where the producer makes only a few lines of product all in the same price-class, or sold to the same types of consumers;
- (b) where all or any of the products are differentiated to the same extent from other products, and there is no balance of advantage to be gained by setting special competitive prices;
- (c) if the products manufactured are all subject to competition from other producers in the same measure and of the same kind.

But when the above considerations have been taken into account they do not cover all cases, and much will depend upon the custom of the industry and the practice of the individual firm. For example, in one industry two firms adopt the method of fixed percentages and two firms the method of different percentages on different lines. In another industry all three firms adopted the method of differing percentage.

In circumstances other than the above a different percentage for different products is usually adopted. The reason for this is that one or more types or lines of product are subject to keener price competition than others. Nearly all firms say that they like to have one or two lines on sale at a very competitive price to ensure a basic load for the factory. This they regard as being of the greatest importance.

Just as we have observed that overhead costs may be imputed on an arbitrary basis to reflect price policy, so also is the profit margin varied on different products. It is certain in many cases that if costs were allocated over products upon a strict imputation, the selling price would be below the actual costs of production, and the profit margin would be negative. This is often the case where a concern sells a number of products through the same wholesale and retail channels. The selling of one product at a very low price may assure an outlet for a large proportion of the output of the factory.

The actual percentage margins added in respect of any

product are rarely disclosed, but it is known that they vary from year to year to reflect policy. It is clear that if a producer has met with severe price competition in one line or type of product or expects to meet it during a period of production, he will adjust his profit margin when making his plans to enable him to sell his budgeted output. To cover the deficiency involved he usually increases the percentage on some other lines which may be sold to a different set of consumers, who may be buyers of articles in another price-class. A large concern manufacturing mixed products, varies its profit margins from year to year in accordance with its expectations of the sales of that product.

The Computation of Profit. As mentioned above, it is not unusual for the actual profit shown upon the preparation of a Profit and Loss account for a period of production, to differ significantly from the total profit expected when preparing a budget. In particular there will be differences which can be ascribed to inefficiency or to unexpected events, such as a failure of demand which could not be foreseen at the time. A producer expects that the profit margin provided by the percentage method on cost or on turnover, will produce some average amount each year, after allowing for those events during the period of production which may sometimes, but do not always, happen and over which, in any event, he has little control. Other changes such as changes in the capital value of fixed equipment, either positive or negative, or damage by fire, are not taken into account. They are capital losses and do not affect the annual fruits derived from manufacturing processes. It is usual to write down the stocks of material and finished goods which have fallen in value during the period of production, but it is not usual to write them up if the value has increased.

The concept of nett surplus or profit which is significant for the entrepreneur when preparing his budget or plan, is the amount arising out of the operations of processing raw material and manufacture of finished products, in a somewhat narrow sense. So long as the lay-out of plant and machinery and equipment which is in use is capable of processing the product in the manner required, the producer takes no account of either a rise or fall in the market value

of that equipment. It is usual, as previously mentioned, to regard as part of the cost of production the diminution in value of equipment, which arises by reason of wear and tear. In some cases also further provision is made in respect of early obsolescence, if this is foreseen. But these are conventional allowances, and nothing is included therein to cover diminution in value by reason of a change in the market price of similar equipment. Nor is an appreciation in market value taken to account as profit. But short period plant, as previously indicated, is written off as quickly as possible and the amount included in costs over one or two years.

The valuation of stock on hand of finished products and work-in-progress is usually made on the basis of cost price or market price, whichever is the lower at the date stock is taken. Strictly, finished stock on hand is worth what it is expected to fetch in the producer's usual market less the selling and overhead expenses which will have to be incurred on sale, during the period over which it will be sold in the ordinary way of business. But the effect of this is to take profit in the current period in respect of stock which has yet to be sold. It is unusual for stock to be valued in this way as producers are reluctant to take credit for profit not yet earned. They prefer to take in such stock at the lower level of cost price or market value if it is lower. The profit earned, if any, then appears in the succeeding period in which the goods are sold. But an ascertained loss or one which is foreseen is attributed to the current period.

There are other fixed or intangible assets in the balance sheet of a manufacturing concern or company, which are valued periodically and appropriations of profit made for writing them down. Only on very rare occasions are they written-up, and then for some special purpose which has little or no bearing on costs of production or the rate of profit expected on turnover. Such assets are the cost of goodwill purchased, patent rights and trademarks, lump sums paid for licences, &c. Changes in the valuation of such assets are not an element affecting trading profits. The amounts written-off such assets from time to time are appropriations of profit after the nett surplus of trading results has been ascertained. If it were not so the profit margins

expected in various industries, and which are added on to costs of production, would vary much more than they do. In general, the capital structure of a company is not the most important determinant of the rate of profit expected. A concern may have expended a very large sum in the purchase of the goodwill of the business, but the size of such an item appearing in its balance sheet does not affect in any way the costs of processing nor the rate of profits expected. It is the rate of profits which have been earned in the past in that industry, and which may be expected in the future, which determine the amount which will be paid upon the purchase of goodwill.

Opportunity costs are not in any sense true costs of production, nor are they regarded as such by producers.¹ Neither are they a part of the expected profit margin which the producer expects to gain upon his processing operations. They are a share of the ascertained profits when division is made between the agents of production entitled to receive them. But the existence of such opportunity costs, when they have become capitalized in the balance sheet of a manufacturing concern, may form an important part of the capital structure, upon which capital a certain percentage return is expected. To this extent they may determine the rate or margin of profit which becomes conventional amongst similarly highly capitalized concerns. If the company which has purchased its opportunity for cash is in a dominant position in any industry, its actions, analysed according to the methods described earlier, may impose upon the industry a high conventional rate or percentage of profits. The outcome of the price policy of such a concern over some years may well depend on the cost of purchasing a similar opportunity. If this opportunity cost is rising there will be no tendency for smaller firms to attempt to challenge the leader's price policy (which includes profit policy). But if the opportunity costs are falling there may be a tendency for smaller firms to attempt expansion or for a new giant firm to come into the industry and seek to dominate the price and profit policy, and maybe to establish prices and profit on a lower basis.

Dividend Policy. Dividend policy is perhaps of most

¹ On opportunity costs, see Marshall, *Principles*, VI, viii, 9.

interest in connection with large public companies whose shares are quoted. But there are a large number of private companies, many of them not director-controlled, whose policy may be of interest. They are called upon, by the corporate nature of their organization, to make a clear distinction between capital and revenue. They may and often do make a distinction between interest for the use of capital and earnings of management, especially if there are some shareholders who are not concerned with the management. Partnerships are enabled, unlike limited companies, to withdraw and pay up any capital as and when required, and will be dealt with separately.

Public Companies. In the case of a public company the directors stand in a fiduciary relationship to the company. The same is true of a private company, but the relationship may be blurred where the directors are the chief or only shareholders, without violating the spirit of the Companies Act. The directors of a public company are conscious of a responsibility not only to the company as an artificial entity, but also to the shareholders and those members of the public who are likely to become shareholders in the future, by the purchase of shares in the open market. Herein lies the main distinction between the public and the private company. It is not a legal distinction but it represents the outlook of business men and the general public who are shareholders. In the rare legal cases which arise, a very high standard of conduct is required of directors of public companies in respect of certain matters, and it extends, or has been extended by directors themselves, to all the activities of the company.

In deciding dividend policy the directors take into account the nature of the business of the company and the policy which shareholders expect them to pursue. For example, if the company is subject to violently fluctuating profits taking one year with another, the directors may decide to stabilize dividends by creating a reserve fund and replenishing and depleting it as occasion requires. In the case of a company owning a rapidly wasting asset it may have become customary for shareholders in such concerns to expect dividend policy to neglect the amount of wastage which has occurred, and to pay in dividend almost the full profit of the

year concerned. The shareholders are quite prepared for the dividends to come to an end when the expected life of the company reaches its close, and to lose all their capital or perhaps only regain a little of it, upon the winding up. Some gold-mining companies may well be put in this category. The shareholders of a coal-mining company do not normally expect the company's accounts to make provision for the fact that the mine is a wasting asset. Some reserves may be built up from time to time and depleted at others, to maintain dividends at about a certain level, or alternatively the annual fruits may be divided as and when they arise.

In almost every industry there is found to be some tendency to follow a settled policy, although every company in that industry may not adhere to it. Shareholders in public companies often invest in certain classes of companies on account of their dividend policy. Some investors prefer a steady rate of dividend year by year, and others prefer to buy shares when prospects are good and when they may expect the company to distribute enhanced profits in the year in which they are earned. Their expectations are more quickly realized in such a case, than they would be if the dividend policy was such that a large proportion of profit was placed to reserve and not distributed as dividends. The directors of companies which may fall into such fairly well-defined categories, make it their business to know what shareholders' expectations are, and if such expectations are conformable with the general organization and policy of the company concerned, the directors take account of them in deciding their dividend policy. It would be hazardous to pretend to decide exactly how much weight directors of companies give to shareholders' expectations. If in any particular year the ascertained results do not yield a sufficient dividend to meet shareholders' expectations, it is often the case that directors do not readily make the decision to draw upon reserves. It is much easier to meet shareholders' expectations when profits may have fallen, if the only adjustment required is a reduction in the amount of current profit to be carried forward to a succeeding year. In this event it is certain that in years of temporary decline in profits the carry forward of many companies is reduced so that shareholders are not disappointed of their expectations. Of course, much

depends on the rate of dividend which has been declared in the past. If the amount of current profits carried forward at the end of each year has been small, there is no margin left out of which dividend can be paid without drawing upon reserves. It is, therefore, the practice to carry forward an increasing margin of current profits in every year, where this is possible. The psychological effect of reducing the amount of current profits to be carried forward to a succeeding period, is much different from that of actually drawing upon reserves which have been previously created and separately shown in the balance sheet. Before the Kysant case it was not regarded as unlawful or unusual to bring back reserves into the current year's profit without showing the figures in clear detail, but now the effect of such transactions has to be clearly expressed. A reduction of the carry forward is not nearly so obvious as a transfer from reserve; although it is shown equally clearly in the Profit and Loss Appropriation account there does not seem to be the same deliberate sacrifice of accrued surplus when the carry forward is reduced as there does when a deliberate transfer is made of profits previously put to reserve.

In the case of a public company there is also an indicator of the rate of dividend shareholders are expecting, by the publication of market forecasts in the financial press. It is customary from time to time to observe speculation in the press upon the current business prospects and expected profits of a public company whose shares are quoted. Some commentators forecast the profits expected to be realized on the conclusion of the financial year and upon this forecast, having some knowledge of the directors' dividend policy, they impose a forecast of what amount of dividend is likely to be declared. Not many cases are met where directors explicitly confirm that their dividend policy is related in any way to current market forecasts. Such forecasts may sometimes be taken as an indication of the rate of dividends shareholders are expecting, but in general directors of companies have other information of more value. They are often in touch with many of the chief shareholders, if they themselves do not hold the majority of the shares, and direct information is available of the dividend policy the shareholders would expect the directors to adopt.

Sometimes it is possible to ascertain from the sense of the annual general meeting of shareholders, the expectations which they have formed. If a company has been following a very conservative dividend policy and has built up reserves of undistributed profit, some of the shareholders at an annual meeting often ask questions of the chairman to get him to indicate 'when the melon is likely to be cut'. This is a well-known expression for the distribution of large accrued profits by the issue of bonus shares or a payment in cash. Many companies prefer to deal with large reserves in this way rather than by progressively increasing dividends. There always comes a time, if an extremely conservative dividend policy is followed for some years, when shareholders evince anxiety for an increased dividend, cessation of the policy of placing unrequired sums to reserve, and a re-arrangement of the capitalization of the company. But this is all dependent on the rate of growth of the company and any policy of self-financing of expansion which may have been agreed upon. Even in the latter event a company does sooner or later reach a stage when further extensions are not contemplated and the excess reserves are ripe for distribution.

A practice has sprung up in many industries to meet shareholders' expectations of determining and declaring a regular rate of dividend on the company's ordinary shares which expectations of future profits appear to justify. A strong and consistently successful company engaged in a steady business may forecast with a high degree of certainty a certain bare or minimum figure of profits which can be expected over a fairly long period of years ahead. In every year in which the amount of nett profit available is above the minimum expected, an additional dividend on the same shares is declared and called a bonus or bonus dividend. This second part of the dividend, or bonus as it is called, is variable each year and is expected by shareholders to be variable. Their expectations of its amount are easily adjustable by them in accordance with the known trading conditions in that industry. Even if their expectations are not realized there is no disappointment for there has been no holding out, nor have they been led to believe in any way that there is any stability in the amount or rate of bonus.

which will be declared. But they are at all times enabled to rely, with a high degree of certainty, upon the main dividend, which is usually so described. There are often interesting cases in which the amount of bonus far exceeds the amount of dividend, but in general the part which is called dividend is much larger than the small supplementary bonus which is added to it.

A method of this kind is useful in stabilizing a dividend policy, and requires little or no consideration to be given to shareholders' expectations when deciding the rate of dividend which shall be declared, particularly if the main dividend is high in relation to the average rate of bonus declared.

A large majority of those answering the questionnaire reply that the main consideration which they take into account when deciding the amount of profits to distribute by way of dividend, is the finance required for the expansion of their own business. No doubt, many of these are private companies and, as will be shown below, this is always the dominant consideration in the case of a private company. It may also be an important consideration in the case of either large or small public companies. It is often the policy of such companies to finance their own expansion out of profits withheld from distribution and placed to reserve. Such a policy enables them to avoid the uncertainties of the capital market and to embark upon expansion at any time they deem suitable and without the delay occasioned by preparations for underwriting and issue of fresh capital.¹

A large part of British industry is financed in this way and in those cases where a firm is growing, its dividend policy is bound up with the decisions made from time to time to provide for a further investment in fixed or working capital.

Private Companies. Many of the large number of private limited companies are director-controlled, and the shares are generally held by the directors, or relatives, or business friends and associates. In these cases, actual dividends on ordinary shares may not be paid during the company's whole life. Therefore, the rate of dividend is not a factor to be taken into account in deciding the amount of profits which will be distributed. At the present time it is customary for

¹ See App. III, Q. 50.

salaries and fees to be voted to the directors whenever sufficient profits are available, to provide them with a sufficient income upon which they can obtain the maximum earned income allowance for Income Tax purposes. Such an allowance is not made on income received by way of dividends, that is, on unearned income, or upon the profits of companies; it applies to individuals in respect of earned income only. If there is any balance of profit left over which the company wishes to distribute, it may be voted to the same directors up to such an amount as will impose upon them liability to sur-tax. In respect of further profits remaining, there is great uncertainty. On the one hand the directors may wish to leave the profit in the company, not only because they may wish to leave it there for self-financing the company's expansion, but also so that its receipt by the directors will not go to swell their sur-tax liability. On the other hand, great pressure is put upon companies by the Inland Revenue to distribute a large proportion of the company's profits so that assessments can be raised on the individuals in respect of sur-tax. Formerly the conflict did not arise, but since the Inland Revenue now has powers to make a direct assessment on the company and to collect from it the sur-tax which would be payable by the directors if they received a larger proportion of its distributable profits, the conflict makes the result highly uncertain. Where there are outside shareholders who would benefit by an increased distribution, there may be a conflict between them and the directors. The directors, as evidenced by some of the replies to the questionnaire, consider that the company's needs for self-financing of its operations require a large proportion of the annual profits to be retained in the business. Whilst they may have little objection to paying out these profits to themselves as directors, and then paying them in again as increased capital for which shares are issued, they dislike intensely paying out increased dividends to shareholders not members of the family, or to inactive members of the family who are not concerned in the management. From them they are not able to collect again the cash paid out, and return it back into the business as capital. They also dislike the increased capitalization of the company which becomes inevitable under such a system. Upon this

capital, expectations of dividends are sometimes raised in the inactive members of the company, which are difficult to meet when business is less prosperous.

The affairs of some private companies under these conditions are probably reaching a state of chaos, and that particular form of joint stock organization may tend to become in disfavour amongst business men. Certainly the financial side is difficult to disentangle when so many conflicting policies are possible, and when each are competitive in the distribution of resources.

As in the case of public companies, the predominant consideration in deciding dividend policy is the amount required for financing existing business and for the future expansion which may be projected or foreseen. As private companies are forbidden by law from issuing prospectuses or otherwise making public issues of share and loan capital, the finance required for expansion must be obtained either from existing shareholders or their friends, or the company itself must provide for its own self-financing. Therefore, when dividend policy is being formulated, wherever the profits of the company so admit, a substantial proportion is put aside to reserve, either for foreseen requirements or as a general reserve.

Partnerships. This form of economic organization of the firm is not now of importance as the number and relative importance in industry of private partnerships is far outweighed by that of private and public companies. The partners in a firm are at liberty to make whatever arrangements they wish amongst themselves, about withdrawals of profits and of capital. In general they withdraw cash for their own personal use on principles very much the same as those applied by private companies. They set their standard of living at a scale lower than the annual profits of the firm, and often very much lower. The same conservative policy is followed as by private companies, and the dominant consideration is always the cash resources required to finance the business of the partnership. It is very rare indeed to find the part of profits represented by earnings of organization and management included in costs of production, by partnership firms. Generally the margin of profit added to costs when fixing the price covers both interest on capital

and the services of the partners in the management of the business.

Increases and Decreases in Profits. When profits increase above the average of previous years, it is customary for a large proportion of the increase to be placed to reserve and only a small fraction distributed by way of increased dividends or bonuses. Investigation by *The Economist* concludes that in the case of public companies it is usual to divide increases into two equal moieties, one of which is placed to reserve and the other distributed by way of increased dividends. There is no settled practice amongst private companies to distribute increases of profit in such a manner; all depends on the particular circumstances of each company. But failing any special reasons for deciding otherwise, such a method of distribution is likely to be adopted by any prosperous public company. In the case of private companies, for the reasons given above, there are wide differences in practice. Some who enjoy prosperity and do not propose to expand their equipment or do not need to do so, may distribute 80 per cent or more of the increases in profit. On the other hand, companies whose business is expanding may retain as much as 80 per cent in reserve and only distribute 20 per cent.

As regards decreases in profit compared with the average of previous years, the actual distribution depends on whether the reduction is deemed to be temporary or permanent.¹ If of a temporary nature nearly all public companies and most private companies would endeavour to maintain previous dividends by drawing slightly on reserve. There is less reluctance when a special fund for the equalization of dividends has been set up, but it is not usual to draw large amounts from reserve in any year, even to maintain dividends. The questionnaire shows that most of the firms who have replied, would reduce dividends for the year in question.²

¹ See App. III, Q. 51.

² See App. III, Q. 52

VIII

PRICE-FIXING AND POLICY

Price-fixing. In those cases where the firm is in a position to fix the price of its own product, the price is decided upon a consideration of the material facts relating to the business, which have been analysed in the foregoing chapters. It has been shown that very few indeed of the producers are in a position to decide the price upon a consideration of the *actual* costs of production. Usually the price is made up of the expected average cost of production plus a percentage thereon for profit margin. The expected costs may be those calculated upon a system of standard costing or budgetary control, or in the case of smaller firms, upon a special estimate of what cost is likely to be based on previous experience or figures from annual accounts. A formula is devised by some small firms, which can be readily applied and will show substantially the same results.

Obviously, the point cannot be overstressed that price-fixing by the above methods is only available to those firms which really have, in fact, a control of the supply of a product sufficient to enable them to maintain the price so fixed irrespective of the reactions of rival firms. In fixing the actual price account is always taken of rivals' expected reactions, weighted, of course, by consideration of the proportion of the total output of the industry which these rivals produce. That is to say, the profit margin in the price is varied to meet the expected reactions of rivals if they are of sufficient importance and if their policy is known to be likely to be in conflict with that of the producer. An example may make this clear. A firm may decide to change the style, design, or type of a product for the ensuing period of production. The firm realizes that this fact will be known to one or other of its rivals fairly quickly. Indeed, the demand for the old type may be known in the industry to be failing; the type has had a 'run' which is coming to an end. The firm knows that if it produces a new type, one or more rivals will bring one out at or about the same time. Information gets back to the firm of the type its rivals are

likely to bring out if it produces a new type, and the sort of price they are thinking of setting for it. If this reflects no change in their policy, i.e. they are not attempting any spectacular change in prices to try to invade part of the firm's usual share of the market, price is fixed by the first mentioned firm on the basis of expected cost plus a normal percentage for profit.

The price-fixing firms only try to discover and then consider the policy of one or a few firms who are their close competitors, and who share between them a substantial proportion of the total output of the industry; they would ignore a number of small firms in the same industry.

Generally, as we have observed previously, two or a few firms either have a tacit understanding or some custom develops which prevents one firm deliberately making an attempt to expand output in normal times, by spectacular reductions of prices.¹ The cost conditions in themselves partly determine the lower limit of price in conjunction with the amount of profit required to cover the risks involved.

There may be instances where superficially the actual conduct of firms seems contrary to the facts outlined above. There are such instances, and they arise in times of depression in industries which are many-firm and whose products are sold in those nearly perfect markets we have mentioned; i.e. commodity exchanges, marts, &c. But in an industry where one or more firms have a definite control of prices the chief and perhaps the only exception to the rule is where one exceedingly strong firm decides to embark on a price-cutting campaign, and ignoring costs of production of its own products and those of other firms in the industry, deliberately sacrifices its profit margin or expends its capital in supporting losses. Such campaigns are rare in this country, but when they arise all the usual methods of price-fixing are abandoned.² The cost of such a campaign in terms of loss of profit or actual capital disbursed by the strong firm, depends entirely upon the strength of the opposition and their willingness or otherwise to enter the struggle. The outcome is always uncertain, and expectations of the strong firm are often disappointed. It is not a

¹ Cf. Burns, *op. cit.*, chap. iv

² For example, the great tobacco war in the early part of the twentieth century.

policy which commends itself to many strong firms, and the weaker firms who may be driven out of business may often re-enter when the campaign is over and the strong firm begins to increase prices. Such a situation need not be considered in detail as it affects but little the general methods of price-fixing.

Much more common is the situation where the strong firm is predominant in the manufacture of a large number of mixed products. The dominant firm may be subject to price competition by smaller firms in respect of one or a number of its usual products. In that event it often decides to develop extreme price competition in those few lines, while maintaining its usual basis of pricing in respect of other products. In this way it may stifle active price competition by forcing the small competitors out of business or inducing them to follow its lead in all prices. There is no limit to the reduction of price in such cases; only the capital which the firm is prepared to expend or the loss of profit which it is prepared to bear, will determine the lower limit.

While the above occurrences may be rare and not of great significance in the price-fixing process, it is common for prices to be varied on certain lines, if only by a sacrifice of the normal expected percentage of profit. This does not materially alter the basis of price which may still be the expected average costs of production plus a profit margin which may vary from zero upwards to meet changing circumstances.

Period for which Price is Fixed. It seems clear that if a firm fixes prices upon the basis outlined above, such prices cannot normally be changed during the period of production. In fact the essence of price-fixing by the individual firm is that once the price is decided upon it shall not be subject to alteration for some given length of period.¹ One of the reasons for entrepreneurs adopting this system is that it is not practically possible to ascertain actual average costs of production with precision over each very short period, such as a week or a month. Moreover, consumers are not willing to place orders or to buy products on the terms that changes in prices may occur at any time. The nature of the product

¹ For U.S.A. practice, cf. Burns, *op. cit.*, p. 243 and chap. iv.

and the methods of manufacture are such that with the deepening of capital which is usually found in price-leading firms, it would be impossible to compute, with the required precision, the actual costs of any particular batch of products. It is often necessary, on account of the channels through which products are normally sold, to indicate at an early date, in advance of the period of production, the price which it is proposed to fix over a given period. Many products are produced to be sold at standard prices, and these prices are expected by consumers to be maintained for considerable periods of time. The actual length of time for which the producer may intend to keep the price fixed, often depends on the type of product in question. Its design may be changed at well-defined periods, and so long as the design or type is current it may be convenient to maintain the price.

It is customary in some industries to fix prices and maintain them in this way over a period as long as 12 months. There are a few examples of much longer periods, such as two or three years, which are usually producer-retailer industries and where the goodwill of the firm has been built up on the basis that frequent changes in prices do not take place.

In those cases where it is not customary in the industry or for the firm to fix prices with such strict rigidity as above-mentioned, some firms revise their prices only in accordance with an arrangement that they shall give a certain length of notice to consumers before making the change. The results of such a policy and its impact upon the profit of the firm depends on the length of notice which is customary. It may be as short as a month or so up to perhaps six months. But this is not the general case for the analysis of price-leadership and price-fixing by the strong firm. It applies more to the smaller firms who may have only a small influence over prices, and it gives them an opportunity to review their prices oftener than is deemed to be practicable in the case of the real price-leaders. In many cases, particularly where the producer fixes a standard retail price, when reductions in selling prices are mooted, wholesalers and retailers expect producers to allow them a rebate in respect of stocks on hand which were purchased at the higher price.

This may often be a deterrent to a reduction of prices, when a new season's budget is being prepared. Unless technical conditions have altered so that the reduced prices can be maintained for some long time ahead, the reduction is not usually made.

Forms of Price Policy. It has been noted above that price policy rarely takes the form of a price-cutting campaign by the dominant firm or firms in the industry. So long as the smaller firms do not attract notice to themselves by offering to sell at prices much below the price leaders, the latter do not make any systematic attempt to eliminate their smaller rivals. So long as the small firms follow fairly closely the prices set by the leaders, the relative proportions of output of each may not be altered significantly and in that event the leading firms will not make any great effort to eliminate them.

While costs of production may differ significantly between the price-leaders and the other or smaller firms in the industry, it may not be the policy of the larger firms to reduce prices to such a level that only the minimum profit is earned. On the contrary, they may keep for themselves as long as possible the benefit of any decreases in costs which they know are not available to rivals or smaller price-following firms.

A quiescent policy of this kind characterizes several industries, more particularly where the methods of production do not change rapidly and where decreases in costs are not regular or occasioned by revolutionary changes in methods of production. The policy may be to maintain normal prices with variations in the style of product from year to year, and to continue the business on conventional lines, seeking only those extensions of output which arise in response to gradually expanding demand for their products. It is not clear to what extent such a quiescent price policy obtains in any particular section of British industry, but it may be found in a few industries where price-leadership has been developed over a long series of years, and the product is one the design and style of which has not changed very much.

Aggressive Price Policy. In the newer industries some

price-leaders have adopted and follow what has become known as an aggressive price policy. In some industries they may have reached the position of price-leaders by following this policy, or, alternatively, their very position as producers of a significant proportion of the total output may have enabled them to follow that policy.

An aggressive price policy may be described as a systematically designed scheme of reducing the price of a product by so changing technical conditions and costs that it is profitable to force on output rapidly beyond certain dead points, so that a new and more favourable productive position is reached. The intention is to popularize the demand for the product so that the actual and potential markets are extended either gradually or more generally by a series of leaps, from one production season to another. The risks of such a policy are great but they can be minimized by a system of standard costing and budgetary control. It is only possible to adopt an aggressive price policy in its fullest vigour when the expected costs of production over a series of periods ahead are declining on account of improved methods of production which can be foreseen. Obviously, the newer industries are those in which a producer may either choose or be compelled by the actions of his rivals to adopt such a policy. The example readiest to hand is that of the motor industry. Up to the outbreak of war in 1914, the methods of production were undeveloped. That is to say, motor cars were built individually and many of the machine and hand processes involved were slow. The cost of producing a car under those conditions was high, and if the demand had expanded costs could not have been reduced very much by producing larger numbers by the same methods. Nearly all the individual firms in the industry who recommenced business in 1919 reconsidered their methods of production and began to adopt or follow an aggressive price policy. The design of the product was altered almost every production season to enable a car to be produced at a lower cost, and by adapting machines to produce in quantity in a shorter time those parts which had formerly been made by slow and cumbrous operations. In a few years the price of a motor car had fallen sharply although the profits of the individual firms and the industry

were expanding rapidly. Now it is possible to produce and sell a car at a price which is about one-third or one-quarter of the price current twenty years ago. Of course it is not the same type or design of car and there may not be the same weight of material in it, but the present models probably serve the purpose better and are more reliable and useful than the older types. The reduction in price might have occurred even if an aggressive price policy had not been followed. The prompt reduction in prices when technical improvements in manufacture reduced costs, has had the effect of stimulating an increased demand, which in turn has enabled production to proceed on a larger scale at decreasing costs.

Changes in Prices. A producer who has adopted a policy of maintaining a fixed price for a period or season of production, does not, in all normal circumstances, change the price during the period. Such complete rigidity is not always undertaken by the producer by means of legal contractual arrangements with purchasers of the product. Generally there is only a tacit understanding or a custom of the trade or industry which necessitates such price-fixing on a firm and rigid basis, but price changes during the season will not be made in any normal circumstances. The term 'normal' in such context includes an allowance for all the changes in cost and in demand, and thereby of output, which may or may not be foreseen but which arise out of circumstances which are not catastrophic such as war, strikes, and lock-outs. It is clear that no producer's production plan could make provision for the changes in costs arising out of such exceptional conditions or for the readjustment of delivery dates required. But all normal changes in the buying prices of raw materials and semi-manufactured goods and labour costs are smoothed out by the producer within the output plan itself, and are not translated into changes in prices. In these cases the producer is normally able to cover himself in whole or in part, by contracts for the purchase of raw material and often-times, but not as a wide rule of general application, against changes in wages rates too. In most cases of rigid price-fixing, the producer uses his profit margin as a buffer or pool. As a buffer it

takes up the impact of all adverse and unforeseen changes in costs. As a pool it takes up all decreases in costs which occur. The profit margin is calculated so that it is sufficient to allow of the smoothing out of all normal changes which may occur.

Generally a firm does not set itself to fix prices rigidly for a season of production, or even subject to change by giving long notice, unless the organization of its business is such that it can enter into firm contracts in respect of the purchase of raw materials and semi-manufactured goods, and can foresee changes in wages rates. The most uncertain element in costs, the risk of changes in which is often undertaken by those who fix prices rigidly, is wages. In the event of adverse changes, the amount of the change if of an order not exceeding $7\frac{1}{2}$ per cent to 10 per cent, is borne by the producer out of expected profits, and the selling price of the product maintained. If the change is of a higher order, before altering the fixed selling price the producer endeavours to reduce his costs in some way, and very often is successful. The methods adopted have been explained in the earlier part of this work.

Entrepreneurs say that when forced by circumstances to reconsider costs of production, it is surprising how they can be readjusted, often in a significant way. But the kinds of industries to which this would apply are limited, as indicated, to the newer industries where there still remains scope for technical advance or rearrangement of processes.

If during a season or period of production the expected costs per unit do not closely coincide with the actual costs of production, the producer when forming his expectations for a succeeding period of production, reviews his standard, estimated or expected costs, and his experience during the period that has just ended becomes part of the basis upon which he formulates the standard for the ensuing period.

At the time when plans are being made, the producer often gives an indication to consumers that a change in the price of certain products is intended to operate for the succeeding period of production. It is only at such times when plans are being made, that consideration is given to a change in the price, and the analysis of producers' price-fixing is only relevant to that period. That is to say, during any

season or period of production there is nothing to be gained by attempting to assess the producers' reactions to changes in demand. The answers to the questionnaire indicate that not only do all producers who fix prices rigidly, make no attempt to alter them for increases in demand, but also many other firms whose prices are not so rigidly fixed do not take advantage of increased demand to increase prices. This applies generally whether or not costs of production increase or decrease by reason of expansion in output. This result may seem surprising and if it is borne out by closer investigation of the affairs of a larger number of firms than that at present under discussion, the conventional short period analysis will need revision.

The producer who does not alter his prices during the period of production may be following, as shown above, a quiescent or aggressive price policy. If he is following an aggressive price policy we find that changes in prices may take place at the beginning of each production period to reflect changes in cost. It is only then and at that time, that any changes will take place, and in determining entrepreneur's conduct in any given situation, it is only necessary to ascertain the time in the year which we are examining and the date when he makes his plans, to decide what his course of action will be. If the time in question is in the middle of a production season, prices will not be changed in response to any stimulus except some catastrophic event. If the stimulus is at or near the relevant date in the year when plans are being made, its effect will be immediately translated into expectations and will affect significantly the price-fixing for the ensuing period. It is essential, therefore, when examining the conduct of the firm, to know the practice of the individual firm in question and the custom of the industry, before entrepreneurs' actions can be assessed and the effect on prices can be calculated.

There is no reason to believe that alterations in costs of production entailed by changes in costs of raw material or wages rates will necessarily determine the amount of any alteration of last period's price when a new price is fixed for a forthcoming period of production. In fact a new price and perhaps a new product obtains in each period of

production. Undoubtedly changes in costs which have occurred during a period, that is to say the sum of the deviations of actual from expected costs, do enter as an element into producers' expectations and condition them in whole or in part. But as each output plan must be taken as a whole and if compared with any previous plan would show many other changes in the product and the organization of the factory, it cannot be assumed that the measure of changes in prices between one season and another will be indicated by just the exact changes in wages and cost of raw material. In fact, a producer may be applying entirely different considerations, and his price policy may be such that with changes in organization he may even be able to reduce the price when last year's actual exceeded estimated costs, if other conditions make it possible. So that in general the changes in prices of finished products sold under a rigid price-fixing system, may vary for other reasons quite apart from changes in the cost of raw material and labour in the industry and be variable, if they are variable at all, with changes in the producer's price policy.

If the producer is following an aggressive price policy, as many of the newer industries do, the price may be reduced almost every season of production for a series of years to pass on the economies of large scale operation in reduced prices and to widen the market.

Firms Who Fix Prices but not Rigidly. In a few industries there are price-leaders who have not adopted a policy of fixing prices so rigidly that consumers expect such prices to be maintained for a full year or season of production. But these firms do not alter their prices at short intervals either for changes in demand or for small changes in cost. They are often in a position to make contracts for the purchase of raw material and semi-manufactured goods, and also in some cases to fix wages rates fairly firmly or subject to long notice of change. Their actual reactions to changes at any time are dependent upon these factors and particularly the length of time for which they have contracted for supplies and also for which they have made selling contracts with consumers. In addition, it may be customary in the industry

to give a certain length of notice of changes which are proposed in selling prices.¹

Some firms and some industries are not able to make firm contracts for the supply of raw materials, &c., for a period longer than three or six months, and in that case they usually have some notice before the contracts expire, of alterations in prices to operate during the new period of contracting. They usually arrange with their customers to give them a reasonable notice of alterations in selling prices, and notice will usually be given some little time before the firm is entering into new contracts for its own supplies. Even in these cases the producer either undertakes or is compelled to bear the adverse changes in costs which occur over a period or the length of time elapsing between his having notice of increases and the expiration of the notice to be given to consumers. The same firms often pass on decreases of costs to consumers immediately, but many take the opportunity of adding favourable changes in costs to profits. Much depends on the custom of the industry and the expectations of consumers.

The above analysis appears to apply to all those firms who have an opportunity of fixing prices for their own products but do not fix them rigidly, or hold them out as so fixed.² In the industries concerned, whatever changes are made by the price-leaders are followed in whole or in part by the other smaller firms who are price-followers.

§ *Comparison with Quasi-Automatic Price-Fixing.* A clear distinction between those firms who are price-fixers or who are engaged in the same industry as a price-leader and follow that firm's prices, and firms who sell their products on organized marts or commodity exchanges, is brought out by a comparison of their respective reactions to changes in demand and in costs.

§ Several firms who sell most or all of their products on such marts and exchanges have answered the questionnaire, and if a summary of their replies analysed below is compared with that given by price-leaders, shown above, distinct differences will be observed.

If demand increases sharply or the firm has an unusual

¹ See App. III, Q. 29.

² See App. III, Q. 23.

quantity of unfilled orders, it increases its price quoted for future deliveries. There is no reason why it should forego profit when an increased price has been quoted on the exchange and is known to all buyers and sellers. If it did so it might not be able to cope with the increased output demanded at that price immediately, and might disappoint old customers in respect of delivery dates. Further, it is only at such times that many firms are able to earn a substantial profit, which when averaged over a series of years with smaller profits and losses, results in a normal profit over a long period.

Even if costs remain unaltered by reason of expansion in output or if they decrease, the firm will still increase its prices for future deliveries to obtain a price at or about that quoted on the exchange. If costs increase by reason of an expansion in output, prices are often quoted much higher than those ruling when the last quotation was made, either as an alternative to declining the business or to force up prices still higher.

Firms in this situation are often engaged in the primary or early stages of manufacture. Their raw material is usually bought on commodity marts or exchanges and forward contracts may only be possible for short periods or for various reasons may only be desirable for short periods. The finished products of their industry may fall to be regarded as intermediate products because all the stages of manufacture to put the products in the hands of final consumers may not be completed by those industries. As indicated earlier, the opportunity of price-fixing arises in the main in those industries which complete some one or more of the later stages of processing.

These firms whose products are subject to quasi-automatic price-fixing can rarely hope to translate increases in costs which do not affect all firms in the industry alike, into changes in prices. For example, if one firm has some difficulty with its processing operations or some inefficiency appears in its plant, its costs will increase, but there is no possibility of its obtaining an increased price for its product. If an attempt is made to recover some of these costs by quoting prices higher than those reported on the exchanges or marts, it is unable to obtain orders. Therefore, such

adverse alterations in costs have to be borne out of profits or actual losses may be incurred and the firm may ultimately go out of business. Inefficiency of plant and organization causing costs to be out of line with most other firms in the industry is one of the main causes of business failure.

Alterations in costs which affect all firms in that industry more or less alike (i.e. changes in the basic rates of wages or in the cost of raw materials) are translated into changes in prices quoted for future delivery with a very short time lag, often as short as a week or a month, particularly if expectations of further increases begin to be formed. In such a situation the quoted or reported prices alter either upwards or downwards to reflect the changes in costs of production.

Some firms in industries subject to these conditions indicate that in times of depression the price sinks so low that for some firms it is lower than their actual currently computed costs of production. Such firms are only enabled to continue in business by employing their capital resources to support losses. Experience shows that some high-cost producers remain in an industry for many years by using capital to meet losses. As appeared in the cotton trade depression, the capital strength of some firms enables them to continue in business for a long time if they are unwilling to leave it, and nothing short of a rationalization scheme and the forming of a price-fixing association will enable normal profits to be obtained by most of the firms in such an industry. It is extremely difficult to decide whether the prices of such products, in depression, are most influenced by the actions of the efficient firms who force down prices to keep up output at decreasing cost, or by inefficient firms who are deliberately offering to sell at a loss merely to get some output from the factory while they are expending capital in the hope of recouping themselves in the future. A more detailed investigation is required before the point can be decided.

In the case of changes in prices arising in the industries above mentioned, there is only a short time lag between observed alterations in costs and changes in prices quoted for future delivery. But contracts which have been accepted for future delivery may often be on the basis of a firm price

not subject to changes in cost, and in that event the firm may incur a severe loss if it has to meet adverse changes in costs of production. In many industries undertaking the primary processes it is not unusual to meet this eventuality by including some rise and fall clauses to cover the manufacturer against unforeseen rises in costs, and to give the benefit of reductions in costs to the buyer. A good deal depends upon the course of dealing between the parties and the custom of the industry involved. But many replies to the questionnaire show that there is a time lag of one to six months before the firms feel the benefit of working on orders at increased prices, although costs may be increasing over the period.¹ This will be of importance in any analysis of entrepreneurs' reactions to changes in demand and in cost.

Resistance to Price Changes. Many firms whose prices are fixed for a season find resistance to price changes for the new season's production, in certain circumstances. Some find resistance from the wholesaler only and others from both wholesaler and retailer. There are many reasons for such an attitude on the part of wholesalers and retailers, mainly because they dislike having the task of explaining to consumers the reasons for changes which are increases, and they fear that sales of that product may fall. In respect of many products neither wholesaler nor retailer offers any resistance to price increases, particularly if the product is changed in some way or they have ample notice before the beginning of the new season or period of production. Their profit usually takes the form of a fixed or conventional percentage on the cost price of the goods to them and assuming that sales do not fall very much, price increases appear to offer additional profit. In some cases both wholesalers and retailers dislike decreases in prices unless they can see a rapid expansion of sales, for their profit percentage may remain unaltered and when calculated on a reduced cost price to them reduces their total profit.²

Consumers do not often offer resistance to small price changes in respect of products of most firms to which they have become attached. Nor do they in general ever offer

¹ See App. III, Q. 30

² See App. III, Q. 25.

any resistance to price decreases. But producers who fix their prices for a season of production often state that were they to change their policy and occasionally reduce prices during a season of production, their goodwill might be spoilt because those consumers who had bought the product early in the season would complain when it was reduced in mid-season. Such a situation applies particularly to the sale of durable consumer goods such as motor cars, where a purchaser in the early part of the season would be disgruntled if the price were reduced in mid-season.

A practice is developing amongst producers who fix the prices of their products, to fix it not only on immediate sale to wholesalers or intermediaries, but also to determine the final selling price to the consumer. These firms fix the final selling price of the product and allow conventional or agreed margins of discount to the wholesaler and the retailer. They thus have full control of the price at every stage. In many cases a legal agreement is imposed on the wholesaler and the retailer and sanctions are available against those who break it.

Price-Fixing Agreements or Associations. It would be interesting to enquire and discover in which industries or sections of an industry there are formal or informal price-fixing agreements. If it were possible to trace the history of some of the price-fixing agreements known to be in existence, it is certain that much light would be thrown upon the conditions under which the firms in that industry have been operating. It is also possible that a generalization might be founded upon such information about the kinds of products, the relative sizes of firms, the fluctuations in demand and the price policy of some of the firms, which has led to an agreement becoming necessary or desirable, and the arrangements and tactics which have been adopted to bring it about. We are much more familiar with price-fixing agreements which have either been forced upon the industry by legislation or for which legislative sanction has been sought and obtained. Some of these industries have been the subject of political interest and action for a considerable time. They are regarded as key or main industries of the country, and in many respects differ sharply from the multitudinous

small industries which have arranged voluntary price-fixing agreements amongst themselves.

The very existence of price-fixing agreements is an indication that in that industry one or a very few firms acting in concert do not have control of a significant proportion of the total output of that industry, or if they have some small measure of control that their capital strength is insufficient to support a price-cutting campaign which will eliminate the smaller competitors, within a reasonable length of time. Alternatively at some stage they may have decided that they will seek measures to avoid the losses of capital and/or profits involved in a price-cutting campaign.

One or two instances of price-fixing agreements under such circumstances are known. They generally arise where a dominant producer has used his position to begin a price-cutting campaign which has proceeded some way and the discovery is then made that he has under-estimated the capital resources of one or more of the smaller competitors and their willingness to sacrifice their resources to retain their normal share of the total market. This may happen in any industry, particularly where some of the smaller firms may have substantial resources invested in another country, or may have powerful directors connected with other industries in this or some other country. Then it often happens that their strength is only revealed when some disturbance is created by the price-cutting campaign of the dominant firm in the industry. The campaign often ends in one or other of the parties seeking to reach an agreement about prices. Arrangements are often made that the dominant firm shall fix the prices for a period upon its costs of production plus some agreed percentage for profit, and that the smaller firms will follow this price. Alternatively, all the parties may meet periodically and discuss costs and fix a price which is satisfactory to all or most of them.

There are other conditions surrounding the manufacture of a product which often have a tendency to lead producers in that industry to use their efforts to formulate a common price policy. In some cases they have been successful and in others no measure of agreement can be reached. There may be in the industry a few or many firms which produce what for all practical purposes is a homogeneous or only

slightly differentiated product. It may be impossible by advertisement or other inducement for any one or a few producers to attract consumer preference which is strong enough to overcome even minor differences between the prices of one concern and another. In most cases it will be found that the cost conditions of the various producers differ in many respects. One or more firms may be operating with up-to-date plant under conditions of decreasing average cost, and others may be still operating old and worn-out plant. Some firms highly capitalized may be desirous of expanding their output rapidly to reach a range of normal output for the plant over which marginal cost will be constant.

In such a situation price competition is at its maximum and if a few firms are able to make normal profits, many of the others will find the price at which these up-to-date firms can sell is occasionally below actual costs of production of the older firms. This was the case with the coal industry before it became the subject of legislation, and it is believed to be the case in the cement industry, in which a voluntary agreement has recently been concluded. In these industries the amount of capital which has been sunk in providing plant and equipment is in general so large that whatever expectations of improved prices or otherwise producers may have, they are inclined to go on producing so long as capital resources last.

If a price-fixing agreement is made in such industries, it is usual to relate the selling price to an average or ideal cost of production. Reports are periodically obtained by the price-fixing association of actual costs over agreed periods, and when these have been adjusted to reflect expectations of changes in costs of raw material and wages they are used as a basis for the fixing of prices to operate in a succeeding period. The price fixed at any particular time may not suit all the producers in that industry, particularly if their costs of production are higher than the average. It is not usual for the price to be fixed on the highest or the lowest cost of production; in the former case the low cost producers would make large super-profits and would be made much stronger than ever by the conclusion of the agreement, and in the latter case they might be made stronger too because many of the high-cost producers would find the price so unremunerative that they would have to close business.

To ensure the smooth working of the agreement, in all cases where the product is nearly homogeneous it is regarded as essential that a sales quota should be fixed for each firm in the industry. There is much scope for argument as to the basis on which this quota should be calculated. In some instances it may be a percentage of the output sold by each firm over a given period. This may have the effect of weighting the future output of any firm according to its position for the period before the agreement was concluded. It may be that this will penalize the very firms who were anxious to enter into an agreement because their output was falling. As an alternative, quotas are fixed in relation to the present or potential output capacity of the plant of each of the firms. Often provision is made for periodical adjustments to increase the quotas of those firms whose plant has been expanded and had not reached full normal production at the date of the agreement.

In many cases it is not possible or convenient to allocate an exact quota of output and to transfer orders from one firm to another. In that event provision is usually made that any firm exceeding its quota in a given period shall pay into a pool a levy of a fixed amount per unit of product. The balance in this pool is periodically divided amongst those firms whose output has fallen below their quota.

Another circumstance which will give rise to the fixing of prices by a formal agreement is in an industry where there are many firms engaged, often grouped about a modal size, and making a wide variety of products which may come under one trade description or be broadly defined as produced by one industry. In one or a few sections, or in respect of one or a few products, one or a few firms together may control a significant proportion of the total output. But generally many of the products will be nearly perfect substitutes each for the other, and although some products may be differentiated slightly the main force of competition will centre upon the price and the search for buyers. Cost conditions may be closely similar in respect of each producer's plant, but all of them will be generally producing a sub-normal output. If they were all producing a normal output upon which their normal costs are calculated, there would be no tendency for them to enter into severe price com-

petition. Agreements amongst producers in some of these industries are often made, and they generally follow a certain pattern. Prices are fixed upon the basis of actual average costs over some preceding period of all the firms who are parties to the agreement, adjusted where required by expectations of changes in costs in the period for which prices are to be fixed. The products are graded according to some recognized trade custom or by technical description, and prices fixed for each grade or quality. To ensure that the price is actually maintained in practice, various devices of selling job lots and out of season stock are prohibited before certain given dates in the production season. Wholesalers and retailers who distribute the products of such an industry are usually induced to enter into similar price-fixing arrangements so that the price at all stages, from the producer to the consumer, is regulated. The producers undertake to sell only to those wholesalers who are members of the association, and the wholesaler agrees to sell only to recognized retailers, and the retailer agrees to buy only from the designated wholesalers, and each and all of them undertake to maintain the agreed prices for the season. Sanctions are imported into the agreement to strengthen it and to deter any of the parties from underselling any of the others. Usually any party who breaks the agreement is placed on a stop list or black list and the other members refuse to buy from him or sell to him.

It is reported that some of these agreements have the effect of stabilizing the prices and profits of all those who become parties to them; they generally are at least effective in preventing unrestricted price competition, and the failure or disappearance of many of the competing firms. Their continuance in operation depends upon the loyalty with which the members carry out their obligations, and that in turn often depends on the general improvement in the profits which has been effected. Clearly a good deal depends on the effect of the agreement in causing a redistribution or otherwise of output and sales amongst the signatory producers. If some are very adversely affected, they may form expectations of a more profitable output and price policy and break away from the association.¹

¹ For U.S.A. experience of Trade Associations for price-fixing, see Burns, *op. cit.*, chap. ii.

IX

EQUILIBRIUM OF THE PRICE-FIXING FIRM

THE equilibrium of the firm may prove to be too precise a concept to be warranted as a description of the conditions which will be outlined below, but in lieu of a more suitable term it will be used to show the operating conditions of a firm which will maximize profits in any given situation.

↓ The conventional analysis (neglecting the role of time) requires as a condition of the equilibrium of the firm that the output produced is that amount the marginal cost of which is equivalent to the marginal revenue. Obviously, for practical purposes such a concept can only be used by preparing some sort of average marginal cost and marginal revenue over a period or season of production. It is clear that at any given moment or as an average over a very short period, say a week or a month, the actual marginal cost then current may diverge significantly from the actual marginal revenue if it could be calculated at that time. The greater the degree of arbitrariness in selecting the time or the broken part of a full season or period of production, the more uncertain and unreal would be the figures which we obtained. In fact it is only when a complete season or period of production is taken and the costs calculated after the event and adjustments made for stocks of finished goods on hand and work-in-progress, that it will be possible to compute the actual marginal cost.

✓ We cannot deduce in any actual case the disequilibrium of the firm from the fact that over a short period of time marginal cost was in excess of marginal revenue, even if the figures could be calculated. It may be that for some part of a production period it is not possible to sell just that amount of output which is required to satisfy the equilibrium conditions. It may be convenient to keep the plant running although there is no immediate sale for the output, but it is expected that it will be sold before the close of the production period. Little can be gained by attempting any analysis which does not have reference to a full season or period of production, because the output plan of a producer

relates to that period and he will average his results over the full period and not treat separately any parts of it. Further, his price-fixing must be concluded in advance of costing; that is, it is not based upon the actual costs of production. The marginal revenue assumed, explicitly or implicitly, when forming his expectations, cannot be varied to meet actual changes in costs, because price cannot usually be changed during the period or season.

It is necessary to divide into two parts the action which the entrepreneur takes to ensure the equilibrium of the firm.

- (a) His decisions taken when forming his expectations for the succeeding period of production.
- (b) The steps he takes to implement those decisions during the season of production.

It is clear that when making his choice of practical alternative scales of output, he will endeavour to prepare his budget in such wise that his decisions, upon which he is forming his expectations, will produce the most favourable results assuming that it is possible for him to carry them out. As it happens many of these decisions tend to be, or are made to be comparatively rigid and may positively prevent his attaining his most favourable position for the whole period of production. This is part of the risk of such an organization and past experience of the results of such rigidities are an important element entering into expectations for succeeding periods.

But it is clear from this that in any short period analysis not relating to the season of production, we cannot deduce the disequilibrium of the firm from the fact that expectations have not been realized fully and that circumstances, such as rigidities, prevent the adjustment of output to equate marginal revenue to actual marginal cost. In fact, in many industries it will be necessary to take an average over a very long period, say several years, before we can determine whether the failure to equate marginal cost to marginal revenue in any of the given shorter periods had caused the disequilibrium of the firm. ~~X~~ The breaking up of the life-time of a firm even into such periods of a year or season of production, has the effect of isolating some portion of what is in effect continuous output.

Generally, as will be shown below, the most significant decision for the equilibrium of the firm is the fixing of the price for the projected period ahead. Once this price is fixed it is not only the average revenue for the firm, but the marginal revenue for all amounts of output. This arises because the selling price is fixed for the period. It is clear that whatever the amount of output which may be actually achieved, the fixing of the price leaves no provision or opportunity for changing it during the season of production in response to changes in demand. Therefore, the equating of marginal cost to marginal revenue must be effected by means of other variables; the marginal revenue is fixed for that period of production and cannot be altered. The situation is one in which the entrepreneur has bound himself as if he were ready to sell any amount of output at a given price over which he has no control. Therefore, if he can so arrange his other affairs so that he can equate marginal cost with marginal revenue, he will do so, but if he is unsuccessful in this he cannot fall back upon a change in the price, to produce the necessary conditions of equilibrium required by the conventional analysis.

If the above observations correctly define the situation then whatever changes may take place in demand those changes clearly have no influence whatever upon the selling price of the product. Such changes may be noted for inclusion in the budget or output plan of a forthcoming period, and with a change in the entrepreneur's expectations a larger or smaller price may be set for the succeeding period. But nothing can affect the price which has been fixed for the period or season of production. It would be useless, in any event, to analyse entrepreneur's conduct now, that is, at the present time, in an endeavour to explain current prices. Current prices are the results of entrepreneurs' decisions some time past, and except in the extremely rare cases where the prices of finished products ready for sale to consumers can vary day by day, it is clearly futile to attempt to do so. The fact is that current expectations, even when prices are free to vary, affect prices which will be quoted now for future delivery. They do not affect the prices of finished goods which are on offer and ready for sale. Their selling price is compounded of entrepreneur's

decisions which may have been made as far back as twelve months ago.

The situation above outlined with regard to the fixing of the price, and this fixity determining the actual marginal revenue as distinct from the expected marginal revenue assumed for the purposes of the budget, may be elucidated by reference to the actual production plan of a producer. As previously indicated in a general way, the producer having determined the normal output which he can expect to sell, decides upon a price out of a set or series of prices, which may be possible with respect to that product. He generally makes, in some way, an estimate of the various quantities which could be sold at various prices, as a test of whether it will be profitable to aim for one or another of the alternative scales of production open to him, assuming marginal cost is constant over a fairly wide range of output. These tests show that if a certain scale of output is achieved and a certain price fixed for the product, the total return will be a certain amount. Another two or three higher and lower scales of output are computed with different selling-prices, ascertained from agents' reports and suggestions coming in to the firm, and the expected results compared. Alternatively, a computation is made of the deviations from normal output which will be required to produce a given total return if prices are changed by certain given fractions. Then on the information available the decision is made whether the sales of the product will increase by the required percentage in response to the stimulus of a given decrease in price, or whether they will fall by as much or more than the output is assumed to be reduced to give the same total return at a higher price.

These computations are implicit calculations of the elasticity of demand and of marginal revenue which may be expected. They are used in conjunction with an estimate of possible outputs and of marginal costs, to determine the output and price for the season, and are incorporated in the budget or plan. For all practical purposes an entrepreneur in his expectations, sets out for himself in the budget or plan the most favourable position which he thinks he can attain during the projected period of production. To this extent, and to this extent only, can we say that the entre-

preneur is aware of the conditions necessary for the maximization of profits. He budgets on the assumption that these conditions are an ideal at which he will aim and which he may achieve approximately, though never exactly, for the reason shown in the foregoing analysis.

It has been explained that the normal output which is used as a basis when forming expectations is generally about the mid-point of a range of possible outputs all of which are capable of being achieved at a constant marginal cost. This, together with the peculiar situation of marginal revenue in his plans, explains why a producer who fixes prices stands ready to produce any amount of output (which may be required and which is within the capacity of the plant) at the fixed price. Up to the point where marginal cost begins to rise rapidly and there is danger of stressing the plant, he will press output because marginal revenue, that is, average revenue which is the price, is always greater than marginal cost. In fact, although he has budgeted for a normal output which may be some 15 per cent or 20 per cent below the comfortable maximum capacity of the plant, he will always press on output, given the opportunity, until it reaches the comfortable maximum capacity of the plant obtainable without stress or strain. Beyond that point he is not usually prepared to go however strong the demand may be. He either refuses orders, or if convenient he persuades consumers to allow orders to be carried forward into the next season of production. When he is making his plans for the forthcoming season this expansion of demand may cause him to revise his expectations of the most profitable price and to change it to suit the circumstances. The general case is that demand is rarely underestimated; over estimates are more common, in respect of most products. Normal changes in demand are gradual and can be foreseen in the large.

Similarly, when output has a tendency to fall below the rate assumed in the output plan, the marginal revenue in respect of each unit actually lost is equal to the price, and not the expected marginal revenue assumed in the plan. If output falls very much below the normal assumed, the producer often undertakes a special advertising campaign or uses sales promotion methods to try to force output. The

marginal revenue in respect of each unit added to output is again equivalent to the price, that is, average revenue, and over the relative ranges of output is higher than marginal cost. In fact every unit of increased output, as the price is fixed, does not have the effect of causing marginal revenue to decrease, as we should expect in a negatively inclined demand curve. For all practical purposes this demand curve becomes a straight line when the price is fixed, although we cannot assume that the entrepreneur can sell as much output as he likes at that price.

This analysis of the situation gives a clearer understanding of the reasons why an entrepreneur as price-fixer always searches, if output falls below normal, for an opportunity of charging discriminating prices in a new market.¹ He will sell his product in any new market, particularly for export, at any price which is a little above the expected marginal cost assumed for the purposes of the output plan. Such producers explain that any contribution to fixed costs or overheads as assumed in the plan represents unbudgeted profit and therefore is desirable. In fact, several examples have been noted in entrepreneurs' budgets, of discriminating prices. The main or home market demand forms the subject of the budget and then an endeavour is made to increase normal output by selling additional and unbudgeted output in export markets at prices only a little higher than estimated marginal cost.

Methods Required or Used to Implement the Plan to Ensure Equilibrium. The most important element in the producer's plan and a condition required for equilibrium, is the achievement (approximately of course) of the output assumed when forming expectations. This is the keynote of the whole plan. Clearly if the output produced and sold were exactly the same as that amount which is expected, then also by implication the assumed marginal revenue (calculated implicitly, but not explicitly, as previously indicated) for the purposes of the plan has been correctly assessed. It means that although the producer may not actually have drawn the curve he has gauged correctly its location at a point, and probably too the shape of a small section of it. He has

¹ As to price discrimination in U.S.A. see Burns, op. cit., chap. vi.

linked together a price and a quantity of output which can be sold at that price. If the output achieved is that normal to the capacity of his plant and the output for working without stress or strain, the situation is unique and determinate; he has in fact found his most favourable situation for that particular period of production. But there is no evidence to lead us to believe that any entrepreneur either has or ever will be able to achieve such a unique result. Obviously, whatever his degree of efficiency in other respects no entrepreneur has perfect foresight nor perfect control of any of the conditions. Even if a number of years or seasons of production were taken together and the algebraic sum of the deviations from normal output were computed, it is certain that the nett result would not accord with the average normal outputs assumed in the plan.

The first condition then of equilibrium is that the difference between actual and estimated output should tend to zero in the period of production. If we like to look at the matter over a number of production periods, because any actual deviations of the magnitude which can be borne on account of the capital strength of the concern will not cause it to go out of business, then the average deviation over this series of production periods should tend to zero.

✓ In fact, any deviation between actual and estimated output which is within the limits of the minimum and maximum outputs assumed for the purposes of the plan, that is, the range of output over which marginal cost is fairly constant, would not be regarded by the entrepreneur as a factor likely to disturb the equilibrium of the firm. He will not press output beyond the comfortable maximum assumed in the plan, that is, beyond the point where marginal costs are constant. All output up to that point is desirable, but at the point where marginal costs begin to rise, there is danger of unbalancing the plant.

Secondly, the algebraic sum of the deviations of actual from standard costs, should tend to zero. This condition is only partly dependent on the foregoing condition relating to estimated and actual output. In general, if the deviation of actual from expected output tends to zero it is often found that the second condition is also fulfilled. But this is not necessarily the case. As indicated earlier, the unit costs of pro-

cessing may alter during the period of production irrespective of any change in the volume of output. If they do change the entrepreneur uses the methods which have been described, to smooth out his total costs in some way so that the algebraic sum of deviations of actual costs from those assumed in the plan tends to zero.

If the conditions above mentioned are fulfilled within the limits mentioned, the firm has maximized its profits in the given situation in which it finds itself. The actual situation is largely determined by the actual selling-price of the product which has been fixed for that period of production. There will be no tendency for the firm to alter its price and output policy when making plans for succeeding periods of production if the conditions are approximately fulfilled or tend to be fulfilled over a series of production periods.

The rate of profit expected will be approximately achieved and the producer will not alter his profit expectations in succeeding periods either upwards or downwards unless :

- (a) New firms come into the industry. If they follow the prices set by the leading producer and do not show any inclination to attempt an attack upon the price-leaders' share of the total output of the industry, the producer's expectations will only be revised when his output shows signs of falling sharply.
- (b) If other established or the new firms attempt a price war (which they rarely do) the price-leader may decide to join issue in an endeavour to maintain his own share of the total market, by a price-cutting campaign. The outcome is uncertain, as shown above, and does not relate to normal periods.

The tendency for new firms to come into an industry in which one or more firms who are price-fixers are engaged, is not solely or mainly determined by the expectation of earning super-profits which are discernible from the published results or information about profits of the existing firms. Expectations are tempered by several deterrents which cause them to be discounted heavily for the purpose of deciding whether or not to attempt an entry into an industry dominated by a price-fixing firm. This heavy discounting is occasioned by some or all of the following:

- (a) It may be feared that the dominant firm will resist

the entry of a new firm and endeavour to stifle it at once by entering upon a severe price-cutting campaign to eliminate quickly the incoming firm. This is an exceedingly powerful deterrent, and the risk of failure of the expected super-profits is great; more particularly if a large scale output must be attempted at the start to produce at a cost comparable with that of the dominant firm.

Most new firms in Great Britain begin in a small way of business to minimize risk, and expect and provide for a gradual rather than a rapid rate of growth. Obviously, if they are not able to control a significant proportion of the total output of the industry soon after they are established, whatever action they take will have little influence on the price. Generally a new entrant into an industry follows the price set by the leaders and provided he does not affect their share of the total output significantly the price-leaders do not attempt to eliminate him, and their own conduct and expectations are little affected by the new entrant.

(b) In some particular industries a very high initial capital may be required and must be risked in the productive processes. Such a situation is becoming common in many industries owing to the deepening of capital in the present technical methods of production, and it is often the case that the product cannot be produced in any other way. Not only is it extremely hazardous to risk the large capital required but the amount may not easily be raised as there are not many facilities in this country for obtaining capital for new and untried enterprises.

(c) The demand for the product of the industry taken as a whole may be inelastic and any output sold could only be obtained by diminishing the output of the existing firms, usually that of the dominant firms. This would probably lead to a price war at once for which a new entrant would be ill-prepared and disinclined to risk his capital in such a venture.

(d) The industry may be one in which great skill, technical knowledge or ability, may be required. If it is in short supply and the producer is not himself a technical expert, he may have great difficulty in engaging the organization and technical employees required. A large part of the existing technically trained employees would be bound by

agreement to the firms already in the industry, and it may be actually impossible to commence a business of this kind unless labour could be imported from abroad.

(e) The existing or dominant firms may be manufacturing a product which is substantially covered by patents, and in this event it may not be possible to make a substitute product without infringing the patents.

Equilibrium of Price-Followers. A price-follower has been defined herein as a firm engaged in making a product or in an industry, which firm has not, but one other or a few firms in that industry have control of a significant proportion of the total output of that group of products or that industry. Such firms may or may not find it necessary by custom or usage to fix their selling-price rigidly for a full period of production. In many industries these firms have to follow the price-leader in this respect, but in others they may shorten the period to give them an opportunity of revising prices if demand increases sharply and they are pressed with orders for early delivery. This is a situation which rarely arises in normal times and may be disregarded when analysing the general case.

Many of these firms may make up a budget or output plan on lines closely similar to those described above when discussing the actions of the price-leaders. For them the equilibrium conditions are the same as those for the price-leader with an important exception. When they are making their plans and forming their expectations they may fix upon a tentative price for the next season of production and relate it to normal output and costs of production. But they refrain from announcing this price until they have learnt in one way or another the price which the price-leader proposes to fix in respect of his product. If this price does not differ materially from their expectations they proceed with their budget and plan on the assumption that the price they propose to fix for their own products bears the usual relation to the price fixed by the dominant firm. If this tentative price should be found to differ significantly from this usual relation, their own price then announced is modified from that in the plan first proposed to express approximately the normal or general relation to the leader's price. Oppor-

tunity is then taken of revising the other parts of the plan which may be, and usually are, flexible in a minor degree, so that they may budget for normal expected profits for the forthcoming period of production.

Some small firms in such an industry have experimented by fixing prices differing by more than the normal amount from the usual relationship subsisting between their own prices and those of the price-leader. Some have observed that their sales fall rapidly if their price is only a little higher than that set by the price-leader. But they have not found the sales to increase in anything like the same proportion in response to a decrease in price of the same amount. There is very little tendency for them to experiment with prices in an industry where price-leadership is obvious.

✓It may be concluded then that for all practical purposes the price fixed by the price-leader is the going price for sales of the output of these smaller firms. The price represents marginal revenue as well as average revenue, and the firms stand ready to sell as much output as is demanded at that price. They are always willing, if given the opportunity, to press output up to the point where marginal costs begin to rise rapidly on account of stressing the plant. But it is rare that such a situation arises, and it only can arise in case of an exceptional and abnormal increase in demand. In general the proportion of total output undertaken by the several firms in an industry remains fairly constant over long periods of time.

If the conventional analysis were being used the situation for these small firms is one of quasi-automatic price-fixing or near perfect competition, but there is no evidence that the firm can sell just the amount of output which it desires at this going price.¹ In that respect the market is imperfect. The possible sales are limited to the usual or normal share of the total demand which is sold by the respective firms. Nor is it impossible for the firm to sell a good proportion of its normal output at a price somewhat higher than that set by the price-leaders. It can depend on a certain proportion

¹ This assumption that a firm can sell as much output as it likes at the going price is an integral part of the theory of perfect or pure competition. For practical purposes there seems to be, in the case of some commodities, such a slight degree of imperfection in the market that price competition appears to approach perfection, yet the seller must needs seek buyers, because of the lack of organized marts or exchanges.

of the total demand for the products of the industry irrespective of minor differences of price. This policy is a reason which prevents the use of the conventional analysis of perfect competition.

Nor is the conventional analysis of imperfect competition easily applied to the actual facts of any particular case. The difficulty is created by the fixing of the price for some period ahead. This positively prevents the firm from making those adjustments which the marginal analysis deems possible.

✓ The equilibrium of the firm is assured and it is likely to continue production if an average or normal profit is earned over several production periods taking a series of them together and summing algebraically the actual results. Ascertained losses are not necessarily a deterrent from the continuance of production until the capital tends to become exhausted. In many cases fresh capital may be brought in to support losses if expectations are formed of profits in the future. If in any period of production the firm's actual output tends towards normal and the sum of the deviations of actual from expected costs tends to zero, then the firm has maximized its profits or minimized its losses in the situation in which it has been placed during the period of production. The results could not have been improved upon if expectations had taken another form and had involved the fixing of a slightly different price or arrangement of costs.

Price-Fixing in Industries Not Subject to Price-Leadership. Industries not subject to price-leadership, as indicated in several parts of this analysis, are generally those concerned in the extraction of raw materials and crude products, and in some cases in undertaking the first or preliminary stages of processing. The majority of these industries sell their products through organized produce markets, marts or exchanges. Products are often homogeneous or capable of grading or clear description. In these cases the conventional analysis of perfect competition, with slight modifications is applicable. In the case of many crude products the market is so wide that it may be almost, if not quite, practically possible for a producer to sell as much output as he wishes at the going price. But once a process has been

applied to a product and it ceases to be a crude product and is being fitted for use by one of the finishing industries, imperfections in the market appear to be more prominent. In the case of many of these intermediate products there may be price-leadership, and in any of them it is rare for a producer to be able to sell as much as he likes at the going price. The price of any producer's actual output will only vary from the average prices quoted on the exchange or mart by small fractions, but at any time some larger differences may appear on account of the system of making contracts to run for some period ahead. ~~X~~ In such a situation changes in demand which appear have no effect on current prices; they affect prices for future delivery, maybe some months ahead, but in every case prices are free to change at much shorter intervals than they are in those industries where price-fixing for a substantial period ahead is undertaken in advance of production of a finished product.

Another case may be distinguished from those mentioned above, as a variation of the pattern of price-fixing, which has been called quasi-automatic or near perfect competition. The difference lies in the fact that in a few industries, making not crude or intermediate products, but finished goods, no obvious price-leadership can be discerned upon the information available about those industries. Moreover, there may be no exchange or mart upon which the products are sold nor any system of reporting quoted prices or disseminating information about them. Such industries, if any are actually discovered, will by the nature of the case be also many-firm industries, that is, where price-leadership is not possible because no firm controls sufficient proportion of output to enforce its policy. ~~X~~ There is an example which may fit the facts. The woollen industry, not taken as a whole of course, but divided into sections manufacturing products for different purposes, is one which is a many-firm industry, has no organized marts or exchanges for the sale of many of the finished products, and does not display any obvious price-leadership. The firms often manufacture a variety of products as distinguished by their uses or price-classes into which they enter, and they can vary the relative proportions of output of each type or line of product over several production periods. No one firm or small number of firms

together have obvious control of a significant proportion of the total output of the industry, and may not be able to obtain such control because of the possibility of firms varying the proportion of mixed output which they attempt to sell in several production periods.

The conventional analysis of the firm working under conditions of monopolistic competition does not fit with precision an industry such as this. It would normally be assumed that as the number of firms in the industry is so large an alteration in the output or selling price of that output by any one firm would not affect any other producer in such wise that it causes him to alter his price or output policy. This result is supposed to obtain because the effect on the demand curve of any one producer of another producer's actions is small or insignificant as it is spread thinly over a large number and there can be no observable alterations. This is far from the facts. The real test of whether a producer's conduct in quoting prices will affect all or most of the other members of the industry, is whether or not they will obtain knowledge of that producer's actions and the length of the time lag between the action and its becoming common knowledge. ~~On~~ In the woollen industry, and in some others, it is believed that such knowledge, although not necessarily officially collected, comes quickly to the notice of most of the producers in the industry and immediately affects their expectations. In a sense this rapid dissemination of knowledge removes most of the imperfection in the market which would otherwise obtain in a situation where there are many producers making differentiated products all more or less capable of substitution one for the other. In the result prices are at any time affected by the actions of any or all of the producers in the past when quotations for future delivery were being given. The price quoted for future deliveries, according to the custom of the trade, spread over some months ahead is influenced by knowledge of what the various members of the industry are quoting and expectations founded upon this knowledge. The practice appears to be for the firm to be asked, probably at the same time as several others, to furnish a quotation for certain quantities of their products, to form the basis of a proposed contract for deliveries over a certain period, which may be three, six,

twelve months or more ahead. The quotation is given and the price, in the first instance, is based upon expected costs of production either as an average or specially computed for that type of product, plus profit. The actual price quoted will depend upon knowledge of the price which may be known more or less certainly to have been quoted for the same or similar type of product by some other firms. Alternatively, there may be a general expectation of the course of prices arising out of discussions with other producers; not formal discussions but generally in desultory conversation.

When the price has been submitted the receipt or otherwise of an order for those products will condition that producer's expectations when he is preparing to quote prices in answer to other inquiries which may be coming in. If he learns that the contract has been placed with some rival firm at a price lower than the one he has quoted, his expectations are immediately revised downward and the prices he then quotes to other inquiries are on a lower basis. Particularly if the further inquiries on hand show any falling off from normal or are accompanied by hints from prospective buyers that they are expecting a lower price for the forthcoming season, the producer is prepared to reduce his profit margin. It would not be wise to enlarge upon the value of the knowledge coming to the producer and to regard it as perfect knowledge of the course of prices so that the market really does become perfect. But in a general way the practical methods in operation in any industry often tend to influence the course of prices as if the market were nearly perfect. The actual value of the information coming to one or more producers is not significant; what is of importance is the producers' actual reactions to the information and the extent to which it enters into expectations. It is surprising, if the above is not a valid account of the elements influencing the price at any time in such industries, that the effects of changes in demand so very quickly affect prices quoted for future delivery. It is also noteworthy that it is in such industries that producers are always complaining about price-cutting campaigns, not in the sense of a strong firm endeavouring to eliminate other small ones, but a general tendency for a large number of firms to quote prices for future delivery which are actually below the correctly

imputed average cost of production (not including profit) of many of the other firms. It seems that in such industries market imperfection is at a minimum. Knowledge of the course of prices quoted although not formally or officially reported, approaches a practical maximum. It is in such industries that price and profit policy is generally of an opportunist character. Advantage is taken of every change in demand and every circumstance to alter the prices quoted for future delivery. Nothing, of course, can be attempted with regard to contracts already fixed to run over the period current. Generally many firms endeavour to adopt a policy of selling at discriminating prices. Wherever they see an opportunity of obtaining a large order when expected output is likely to be subnormal, they cut deeply into profit margin to ensure a basic output for the factory. When expected output appears likely to exceed normal over some period ahead they take the opportunity of quoting increased prices because they are fairly certain of a basic output, and either wish to decline the order or to gain a higher price to provide for the possibility of a rise in marginal cost.

As most firms subject to such conditions indicate, in normal times when expectations of a normal output over some period ahead are fortified by the average number of orders given firm or for which work is in progress, quotations of prices for future delivery are compounded of expected costs of production plus profit. If any change is made in the price normally quoted on this basis the change only reflects expected and foreseen changes in the prices of raw material and wages.

Conventional Analysis of Long and Short Periods. It has been customary to distinguish between prices in the short and in the long period.¹ Neither has been defined in terms of length of time; it is understood that the distinction between the long and the short period is blurred at some points and that there is no possibility of defining the exact length of time involved. In lieu of a definition of the period by its actual length, it is customary to define the conditions which determine whether the long or the short period is in

¹ Marshall, *Principles*, V, v, ii, etc. (8th Edn.). The main trend of current theory springs from this.

question. It is assumed that the relative importance of demand and of costs of production on price, not easy to assess, may be best examined by the familiar device of holding one element more or less constant, whilst the other is free to vary. This seems to follow from Marshall's statement that both demand and cost of production influence price; the former is most important in the short period and the latter in the long period.

Short Period. In the short period the producer's plant and equipment and organization is supposed to be fixed and unchangeable at short notice, or it may only be altered over a period of time. Therefore if the question arises, what will be the price of a product manufactured by such a producer in those circumstances during the time over which he is unable to adjust those conditions which are temporarily fixed, the answer is unique and determinate. He can only produce a certain maximum output with the given equipment; he cannot alter his fixed costs but (for the purposes of the analysis) he can alter the price and he may even force extra output, or if occasion arises reduce it. In short, he will seek the most favourable use of the plant and he will produce output until the amount is reached where the production of another unit would add as much to costs as it does to revenue.

There is an assumption in the conventional analysis that the fixity of equipment in a short period is such as to impose on the firm a cost curve, the shape and location of which over all its length must be regarded as fixed. If that is so, then if the demand curve changes its location or shape and a new Average Revenue and Marginal Revenue curve is drawn, wherever the new Marginal Revenue curve cuts the given Marginal Cost curve, at that point will output be determined, a new price fixed by reference to the new Average Revenue curve, and profit maximized.

The variables are (a) demand, (b) price. The constant is (c) costs of production over the possible ranges of working the given lay-out of equipment; i.e. the given cost curve for the firm. The analysis will not work in practice to explain present prices; the changes in prices which are supposed to ensue when demand varies in a short-period, do not and cannot occur in fact. As indicated herein, the price is

fixed for a period ahead, and changes in demand do not affect Marginal Revenue, which is constant for all outputs once the price is fixed. Price changes can only be considered at the beginning of the next period of production, when in fact price and output policy is being considered anew. At that time changes in demand (or in costs) which are expected in the forthcoming period of production will be taken into account in determining the price for the season. As indicated, the marginal analysis can be used effectively to analyse the situation at that time, but not at any time during the period of production or in respect of any broken period.

For another reason the marginal analysis cannot be applied effectively at any time within a period of production. The fixity of equipment and lay-out of plant is not such that normal changes in demand cannot be met and smoothed out within the framework of the entrepreneur's plan, yet presumably the purpose of the analysis is to explain 'normal' and not abnormal changes in demand.

A change of 10 per cent to 15 per cent in the amount of a product demanded in any one period of production is a substantial amount, and except in the abnormal circumstances of war or other similar catastrophic events, a change of such magnitude would cover most cases. But in many industries the plant on hand at the beginning of a production period has a resilience of 10 per cent to 15 per cent and in a period of a year there are possibilities of expanding or contracting production still further while keeping within the plan and output, price and profit policy.

The conventional analysis seems to be mainly suitable for explaining price-fixing in the case of abnormal changes in demand, where stock 'on hand' or 'in sight' is fixed and cannot be changed in a short time and price is free to vary, or rather is fixed quasi-automatically according to the strength of demand. In any market where prices are fixed quasi-automatically, prices quoted now for future delivery are affected very quickly by expectations of changes in demand and in costs, and such changes in prices are subject to very short time lags in the case of some industries.

The assumptions upon which the conventional analysis is based do not seem to fit the facts in cases where price is fixed for a period ahead. But subject to the changes

required in the assumptions, it may be used to portray the situation which the firm adopts as a basis when forming expectations for the purpose of the production plan for the period or season ahead.

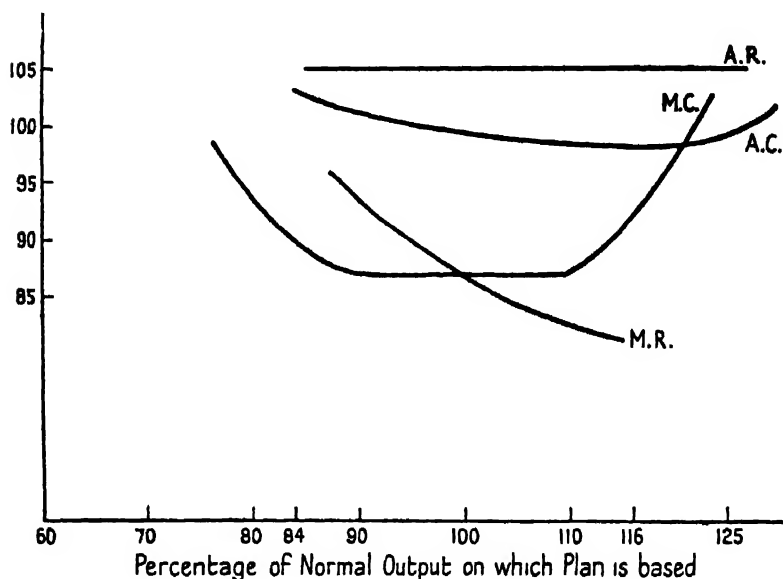
Long Period. The conventional analysis of the long-period follows from the assumptions used in the short-period analysis. In the long-period, by definition, the firm can free itself from the cost conditions imposed upon it by the fixity of the lay-out of plant and equipment. Changes in demand which appear likely to persist can be met by altering the lay-out of the equipment or changing the organization and management of the firm, and a new cost curve drawn from the new conditions may have a different shape and/or location from that obtaining in the short period. The long-period demand curve reflects the changes which are expected over the period in question, and may thus be regarded as fixed in location and shape whilst new cost curves are drawn to show the possibilities of producing a different scale of output for which the equipment can be made and provided within the time in question.

Such a situation is envisaged by firms in some industries, generally where the possibilities of technical advance are evident. For a forthcoming period of production a budget or plan may be prepared for that period and further material included to show what the effect on costs would be if demand were very much different from what it is expected to be in that season, and different technical methods of production were used. Technical progress or changes in methods of production must generally be put into effect gradually, as the trend of changes in demand cannot be so clearly foreseen. Moreover, the demand for products does not normally change so rapidly that over two or three years a very large change in output would be required.

There is no long-period price of real significance in the case of many products, because price and design may change each production season, and technical changes are not always the means of producing the same type or design of product at a different cost, but an entirely different design or type of product to meet the same or similar uses to which the old product was put at a price markedly different, usually very much lower.

As producers' price policy may be aggressive or quiescent, and the product itself may change significantly, it does not seem possible to draw much from long-period analysis. The producer's plan for the period of production is of the most significance.

PRODUCER'S DETERMINATION OF OUTPUT AND SELLING PRICE



A.C. = *Average Costs expected.* *Used explicitly by Producer.*

M.C. = *Marginal Costs expected.* *Determined implicitly (by fixing scale of output).*

A.R. = *Average Revenue—becomes M.R. also when price fixed.* *Proposed selling price.*

M.R. = *Marginal Revenue assumed for Plan.* *Determined implicitly (see 'Contribution' in Production Plan)*

COSTS OF PRODUCTION

SCALE OF OUTPUT

Costs	As % of Total Cost at Normal Output	70%	84%	100%	116%	125%
Materials <i>Add: See Note 5 (b)</i>	52·3	3,661 70	4,393·2	5,230	6,066·8	6,538
Labour (Direct) <i>Add: See Notes 5 (a) and (b)</i>	21·7	1,519 70	1,822·8	2,170	2,517·2	2,713 50
Plant Costs :						
(a) Short Period Plant, Tools, &c. <i>Add: See Notes 5 (a) and (b)</i>	5·6	392 21	470·4	560	649·6	700 25
(b) Plant Operation <i>Add: See Notes 5 (a) and (b)</i>	7·5	525 35	630	750	870	937·5 50
(c) Fixed	7·5	750	750	750	750	750
Establishment, Finan- cial, &c.	3·6	360	360	360	360	360
Selling Costs	1·8	180	180	180	180	180
TOTAL COST		7,583	8,606·4	10,000	11,393·6	12,303·5
Average Cost per Unit		108·3	102·4	100	98·2	98·4
Selling Price as fixed		105	105	105	105	105
Profit or Loss per Unit		-3·3	+2·6	+5	+6·8	+6·6
If Total Profit aimed at is the same for all outputs, then selling price would be		115·4	108·15	105	102·5	102·4

NOTES ON COSTS

- (1) The lay-out of equipment and plant, the organization and management are arranged for a 'normal' or expected output of 100 per cent.
- (2) The works are staffed and division of labour and processes arranged for that output.
- (3) The short-period plant required is either in hand or ordered and in process of being fitted up for that output.
- (4) The other costs are estimated on the same basis.

- (5) (a) *Rising Output.* If demand is greater than expected, output will be expanded within the capacity of the plant, that is, until stress or strain causes bottlenecks to appear, or work is spoilt by being hurried or machinery is being overworked and breakdown is threatened. Some night-shift work may be attempted if possible. Marginal costs begin to rise rapidly at a certain point, and orders may be refused or held over. (See Output 125 per cent where additions to total cost are more than in proportion to percentage increase in output over normal). This is indicated by 'Additions for Overtime, &c.' The main figures are shown otherwise as strictly proportionate to volume of output.
- (b) *Falling Output.* If production has to be continued with lay-out for a normal output, then costs of working at a low output do not fall strictly proportionately with the percentage fall in output. This is indicated by additions to costs, such as 'Extra cost of purchases', Labour, &c. The most economical buying arrangements and division of labour are frustrated by a fall in the output much below that expected. Contracts have been made for the 'normal' output and will have to be revised by arrangement if output falls by a substantial amount.
- (6) The range of output over which marginal cost is constant is + or - 16 per cent of Normal Output in this case. In practice it is likely to begin to rise gradually, just before these maximum and minimum output points are reached. In the illustration the curve is smoothed a little at the extremes of minimum and maximum output. If figures were available for each possible change of output over the range, the curve would be flat for a considerable stretch and then would rise gradually and not so abruptly as the costs taken at ranges wide apart now show.

CONCLUSION

IT is thought that the results of the present approach to the marginal analysis may have revealed some significant conclusions which may be of use in solving other problems.

No attempt has been made to set up models which require abstract (and extremely unrealistic) assumptions for their smooth working. The main purpose of the present work was to examine the marginal analysis and the reasons for casting doubts upon it, and to show how, if at all, the analysis could be interpreted and used in practice, in a broad, general way. Those who wish to regard the theory of equilibrium of the firm as a precise and delicate instrument may be disappointed to find that in practice the organization of production is not such that it can be fitted easily into precise concepts. In fact, forecasting being often only an informed guess, it is important to recognize that the analysis of the actions of the entrepreneur which he takes to implement his decisions, is more significant perhaps than a discussion of the actual forecasts themselves or the basis on which they rest. The marginal analysis with the necessary amendments has been shown to be applicable to the productive situation of some firms who in fact do fix the price of their products, and it may be fairly regarded as of general application if considered in a somewhat broad and not a precise sense.

No firm is likely to be able to insulate itself and its productive and trading activities from the impact of general economic fluctuations. Nor does it seem within the bounds of possibility that any firm will ever be able so to arrange its affairs that its continued existence is assured as a profit-making entity over long periods of time. Yet the important fact emerges from the present analysis that, given a system of making contracts for supplies of raw material and semi-manufactured goods over a period ahead, the fixing of wages rates for the same period within close limits of variation, and the setting of selling prices for the same period based on standard costs, the firm so organized has taken the form of an economic unit partly sealed from many 'market' fluctuations. The very fact that the selling price of its product does not vary during short periods of time is an influential

force upon the demand curve for its product and ensures some regularity of demand over time.

Entrepreneurs, by feeling their way gradually, have discovered for themselves that the fixing of a uniform price for a substantial period of time is a stabilizing factor in the demand for their own product. In any event, price rigidity is to some extent forced upon them by the nature of productive processes and the length of time taken up in production by modern methods.

The analysis may help to resolve the problems of duopoly and oligopoly. In an oligopolistic situation it has always been difficult to decide to what extent a firm could have knowledge of the reactions of other firms within the group to its own price policy, and allow in its own price policy for their effect. If in fact one firm takes the lead in announcing its own prices, and the other firms within the group follow this price (with suitable modifications for the usual or customary margin acceptable to consumers for the particular variety or style of product) then the circularity in the argument about each firm gauging competitors' reactions is removed. If in any 'industry' there is in fact a price-leader, acting as described in the foregoing pages, we know, if only broadly, how the price of any of a group of products made in that industry is determined. The price fixed is not the outcome of the interaction of the decisions of a number of firms within the group; it can be directly related to the production plan of one particular firm, i.e. the price-leader. The actual price-leader in any industry is not easily found and as we have noted, price-leadership may fall at one time to one of a group of firms for a considerable period in respect of a group of 'competing' products. At other times some other firm in the group may assume the position of price-leader in respect of that product or a variation of it, by the acquiescence of the other firms, or on account of a change in the relative scales of output of the several firms making that product.

We may have to give up the idea that all firms who make a product differentiated to some small or large extent are on that account enabled to fix the price of their product in the sense that they have monopolistic powers. The situation of many firms to which the analysis of monopolistic

competition would have been applied, will be found to be one of 'near perfect competition'. The product of these several competing firms is not necessarily homogeneous, nor is the price necessarily uniform (as required to fit the analysis of perfect competition); there are customary and usual or normal differences in the products, and margins of difference between the prices. But these differences are not great enough nor important enough to give the producer the control which is assumed by the conventional analysis of monopolistic competition. These firms, as shown, follow price movements initiated by the price-leaders and have no distinctive price-policy of their own. Price-followers, even if they do produce a markedly differentiated product, cannot in any real sense be said to have control over the price of their own product merely on that account.

The typical situation in British industry seems to be one where oligopolistic elements are of most importance, although there may be a large number of smaller firms engaged within or upon the fringes of the industry, whose price-policy is entirely dependent upon that of the price-leaders.

It may be desirable to indicate a broad division between industries in which price-leadership may be found and those in which it is wholly or mainly absent. It is to be found mainly in those industries which apply the later or finishing stages of the product and which undertake the risks of marketing a product finished and ready for sale to consumers or users. Some intermediate products and capital goods may from time to time be subject to price-leadership, but this situation is not general. In some industries, such as the woollen and worsted industries, which are many-firm, there are no well-organized marts or exchanges for the finished products, yet price-leadership is not evident.

Those industries which are concerned with the extraction of raw materials or sale of crude products, effect their sales at prices wholly or mainly regulated by quotations on organized marts or produce exchanges or by a system of reported average prices. The prices of raw materials and crude products (and goods generally sold on organized marts and exchanges) behave quite differently from the prices of other goods.

The evidence of price rigidities resulting wholly or mainly from contractual arrangements deliberately developed by entrepreneurs, and the existence of price-leadership in industry, may be of significance for trade cycle theory. So also will be the striking fact that such contractual arrangements have not yet been applied generally in respect of wages rates—a serious weakness in production plans which fix the selling price of a product for a considerable period ahead.

It is hoped that the present analysis may be regarded as a beginning of essential empirical studies, and that entrepreneurs will be found who will co-operate in economic research as they have done in the present work.

APPENDIX I

THE Y.Z. CO., LTD.

BUDGET FOR THE PRODUCTION YEAR 1937-8

1. *Demand.* The demand for the Company's products expanded rapidly last year (1936-7), but it is not expected that this will continue for the following year.

The comparative figures are as follows :

			<i>Sales in Units</i>	<i>Profit Nett.</i>
1936-7	...	...	210,000	151,500
1935-6	...	...	187,500	144,750
1934-5	...	...	179,500	139,250
1933-4	...	...	167,750	128,750
1932-3	...	...	155,000	110,000

The Company has sold a little more than its usual proportion of the total sales in the Industry, as far as can be ascertained from the information available.

It is proposed to budget for sales of 180,000 units in the forthcoming year, at the following prices:

<i>Design</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
<i>Number</i>	36,750	30,000	63,000	31,500	9,000	9,750
<i>Selling Price</i>	£10	£10	£15	£17 10	£20	£30

Reports show that a slight recession in demand is likely, as the popularity of some designs may wane a little, but it is not considered opportune, or indeed necessary, to effect any changes in design this year. Products A and D may have to be redesigned next year, dependent upon the new designs which it is understood are proposed by X.N., Ltd., and T.P., Ltd., whose products compete fairly closely with ours. T.P., Ltd. (with an output about one-fifth of our output) kept up its price for a design similar to our A design last year when we reduced ours by 5 per cent. It is understood that our sales of that design increased a little on this account, but as we redesigned our product most of the increase may be attributable to the advance in design. They are proposing to redesign their product and sell it at or about our usual price, but are awaiting a move by us. It is believed that their costs are on the high side because of their lay-out which has not been changed for some years past. Firm X.N., Ltd. (an output about the same as ours) is continuing its product similar to our design A this year, and we learn is not proposing a change in price, which is 5 per cent below ours.

The L.O. Co., Ltd., is likely to redesign type E this year and fix a slightly lower price than last year. They have done well with that

type and it may mean a further small loss of sales to us this year, as they are effecting some further improvements. When we see their new design we can then decide whether or not we shall change ours next year and fix the price a little lower. This can be effected by reducing slightly the present raw material content, and one process (*y*) may perhaps be avoided or telescoped with (*x*). Alternatively, the price may well be fixed a little higher than the X.N. Co., Ltd., as we learn the quality and finish of their product is reported to be a little below ours. We could then put in an extra finish (*lm*) and stress this in usual advertising.

Export. Good progress was made last year with designs *E* and *F* at prices 4 per cent below those for our product in the home market. We do not budget for these export sales in our programme, and the contribution they make to fixed costs and profit is not high as yet, but may become substantial. It is proposed to continue the policy of selling in these markets at discriminating prices which just more than cover variable, i.e. direct costs.

Contribution. The Schedule sets out the additional units to be sold if prices are reduced by ten shillings per unit in respect of each design. This is the smallest practicable change in price. Even in the event of a reduced price not being followed by one or two firms, it is not expected that sales would respond sufficiently to provide the same total profit as can be expected from the present price fixed in the Budget. In the case of design *A* sales would have to increase by 17 per cent, which is extremely unlikely for a price change of 5 per cent when the design of the product itself is unchanged.

2. *Output.* The plant is now laid out for a maximum output of 208,800 units, achieved by making minor adjustments during the last year. The normal output is about 180,000 units to work without fear of stress or strain, or the emergence of bottle-necks, and to keep some plant in reserve for emergencies. The result of last year's extraordinarily high output has been to strain the plant at many points and running costs and labour costs have risen sharply, and nett profit has not risen proportionately. Overtime and night-shift work are consistently disappointing. In certain development periods it may be necessary to use night-shift work, but it is very costly and should not be part of regular policy. The plant, as shown in the books, appears to be about 15 per cent below the reasonable requirements for the output achieved last year.

It is suggested that provision be made over the next three years to install additional plant, and balanced round a normal output of 210,000 units. This will keep in hand a production reserve of about 30,000 units, which can be achieved if demand expands, without straining or stressing the plant. The full maximum output for which such

lay-out would be designed would be about 243,600 units, but this could not be achieved in practice.

There must be a measured attack over the next three years, if demand shows signs of increasing, upon a removal of known 'bottle-necks'. A capital expenditure of £50,000 would be called for.

Reorganization is proposed to reduce the number of 'short settings'. Arrangements for a smoother flow of material and storage facilities are now available.

The Schedule of New Hourly Cost draws attention to the difference between the costs of dayshift and three-shift working when using expensive items of plant as compared with cheaper plant and tools. Further consideration must be given to this aspect of the advancing technique of production.

3. Costs. Estimated for 1937-8.

Design A. Proposed Selling Price £10							%
					£	s. d.	
1. Raw Material and semi-manufactured goods	...	...	...	...	4	19 4	52·3
2. Labour	...	...	...	...	2	1 3	21·7
3. Plant Costs :							
(a) Short Period Plant, &c.	...	...	...	...	10	8	5·6
(b) Plant Operation	...	...	...	...	14	3	7·5
(c) Fixed	...	...	...	...	14	3	7·5
4. Establishment and Financial	...	...	...	...	6	10	3·6
5. Selling Costs	...	...	...	...	3	5	1·8
					£9	10 0	100·0
Add 5% for Profit					...	10 0	5·0
					£10	0 0	105·0

(Similarly for other designs B, C, D, E, F.)

Materials. Contracts have been arranged for 80 per cent of raw material and 95 per cent of semi-manufactured goods required during this year, for the volume of output mentioned herein.

Labour. Allowance has been made herein for increases in wages rates which have been agreed and which will come into force in one month. No further change is anticipated during the year.

There is always difficulty in adding to the nucleus of skilled employees. The training scheme is working fairly well, but if this year's policy should be reversed and output expanded more rapidly this aspect of costs will require close attention. Until a modicum of

skill has been attained by the new employees coming in, more supervision is required to ensure that production is not slowed down at certain points.

Overtime and night-work were disappointing last year. It should be avoided by bringing it within the range of day-shift management as soon as possible.

CONTRIBUTION

<i>Design of Product and Price</i>	<i>A</i> £10	<i>B</i> £10	<i>C</i> £15	<i>D</i> £17 10	<i>E</i> £20	<i>F</i> £30	<i>Total</i>
1. Profit on Products	£18,375	15,000	52,250	27,563	9,000	14,625	136,813
2. All Oncost	£56,197	74,100	233,491	136,237	44,469	45,800	590,294
3. Contribution required	£74,572	89,100	285,741	163,800	53,469	60,425	727,107
4. Number of Units	36,750	30,000	63,000	31,500	9,000	9,750	180,000
5. Contribution per Unit	£2 19 5	2 19 5	4 9 1½	5 4 0	5 18 10	8 18 3	
6. Total Cost of a Reduction of 10/- in Selling Price	£18,375	15,000	31,500	15,750	4,500	4,875	
7. Reduction in (6) is equal to Contribution on Units	6,187	5,050	7,069	3,029	757	581	
8. Additional Units required to be sold (as percentage of that assumed (4), for Budget) to provide same Total Profit	17	16·8	11·2	9·6	8·3	6	
<i>Percentage change of price</i>	5	5	3½	2·8	2½	1½	

Study of New Hourly Cost. Examples showing the cost of Running Plant using Expensive Items with Heavy Oncost as against that which is of small value with Light Charges.

						<i>Works Hours Per Annum</i>
Day-shift	...	...	...	...	...	2,400

Development of Three Shifts.

Shift No. 1	...	...	...	...	...	2,200
Add 2nd Shift—1,950 hours	...	...	...	...	...	4,150
Add 3rd Shift—1,850 hours (total hours available)	...	...	...	...	...	6,000

UNION HOURS

<i>Three Shifts System</i>	<i>Per Week</i>
Shift No. 1—6 a.m. to 2 p.m. Effective Works Hours	43
Shift No. 2—2 p.m. to 10 p.m. Effective Works Hours	37½
Shift No. 3—10 p.m. to 6 a.m. Effective Works Hours	37½

Allowance given

Shift No. 1	Per man, per week. The following hours are paid for but not worked.	{	2
Shift No. 2			7½
Shift No. 3			9½

Table I. EXPENSIVE PLANT

		<i>Day Shift</i>	<i>Shift No. 1</i>	<i>Mean of 1st and 2nd Shift</i>	<i>Mean of 3 Shifts</i>
		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Interest Hour	...	5 0	5 6	2 6	2 0
Tool Hour	...	15 0	16 6	10 0	7 0
Wage Hour	...	5 0	5 6	5 6	6 0
Service Hour	...	6 0	6 6	3 6	2 0
Experts Hour	...	4 0	4 6	2 0	1 0
Depreciation Hour (20 years)	...	5 0	5 6	2 6	2 0

<i>Total cost per hour.</i>	Dayshift	...	...	...	£2	<i>Index 100</i>
	Mean of Three Shifts	...	...	...	£1	<i>Index 50</i>

EXPLANATION

<i>Interest Hour</i>	Cost of Interest per effective hour available.
<i>Tool Hour</i>	Cost of tools and short period plant consumed either through wear or obsolescence.
<i>Wage Hour</i>	Cost of Production Wages.
<i>Service Hour</i>	Cost of Housing, Heat, Light, Power, Area, Maintenance, Crane, Trucks, Conveyors, Oil, Establishment.
<i>Experts Hour</i>	Cost of Designers, Tool-setters, &c.
<i>Depreciation Hour</i>	Replacement fund over period indicated.

Table II. CHEAPER PLANT

			<i>Day Shift</i>	<i>Night Shift</i>	<i>Mean of Three Shifts</i>
			pence	pence	pence
Interest Hour	...	...	18	22·5	20·25
Tool Hour	...	...	12	15	13·5
Wage Hour (200 operatives)			2500	3125	2812·5
Service Hour	...	...	20	25	22·5
Experts Hour	...	...	15	18·75	17·0
Depreciation Hour (5 year)			8	10	9·0
<i>Cost Index</i>	...	...	100	125	112·5

Observations. Advancing technique of production is such that an adequate return can be had from elaborate and expensive machinery only if it is used for many more hours than those which obtain with present day-shift arrangements.

Table I brings out clearly the fact that there is great economy in working an expensive machine for extended hours, in spite of the rising wage costs. This is because of the heavy weight of material, service, and financial items, as compared with production labour.

But where cheaper plant is used, production is much more costly by any system other than one day-shift (see Table II).

The plant must be balanced and careful consideration given to the above observations when new designs of product are to be considered.

APPENDIX II

WHOLESALESALE AND RETAILERS

In the conventional analysis of the equilibrium of the firm no distinction is usually made between manufacturers, wholesalers and retailers. The 'seller' of the product may be either or any of them and no attempt is made to determine their respective positions in the price-fixing process. In general the analysis is used to explain the conduct of the manufacturer, who decides the amount of a product he will produce with his plant and equipment. In this sense wholesalers and retailers are not producers; they are not normally regarded as having control of the output of a product. It does happen occasionally that discussions are carried on about the location of sellers¹ and the resulting imperfection of the market, which give the impression that any economic agent who sells the products of industry may have some control of output and price.

There is a system of prices in respect of finished goods ready for sale which, subject to overlapping in some special cases, may be divided up as follows:

- (a) Producers' price, paid to producers by wholesalers and intermediaries.
- (b) Wholesale price, being that charged by wholesalers to retailers.
- (c) Retail price, charged to ultimate consumers.

There is a close connection between these prices. Wholesale and retail prices bear a certain relationship and so do producers' and wholesale prices. The base price which in general determines other prices is that fixed by the producer.

Wholesalers. In those sections of industry where it is usual to sell products through the agency of wholesalers or intermediaries, there is a possibility that the wholesaler may have some slight influence over the price which is charged to retailers, and thereby may affect the selling price to the ultimate consumer. But in practice the wholesaler is usually remunerated for his services by a recognized or conventional percentage on cost (producer's price) or discount from the retail selling price, if goods are priced on that basis by the producer.

In some cases merchants follow customs, self-imposed, of adding to producers' prices 'a fixed amount in the pound or shilling'. In others an addition is made to cost on the basis of the weight of goods handled. Many products are branded and advertised widely so that a wholesaler must stock them if retailers call for them. In these

¹ Cf. Chamberlin, *op. cit.*, p. 86 and *passim*.

cases the selling price is fixed and advertised by the producer and wholesalers receive recognized percentage discounts. The wholesalers' prices are dependent upon and closely related to the producer's prices.

Retailers. Many products are sold direct to retailers by manufacturers, and the retail price is often agreed when the order is given. The retailers' overhead costs and profit are usually covered by a customary discount from the agreed selling price, or alternatively by a fixed percentage on the cost price. Subject to special discounts for large lots in bulk, the producer's price to each retailer is approximately the same in respect of any particular product. The situation is similar in those cases where it is customary for a retailer to buy from a wholesale merchant.

*Price Maintenance.*¹ Those producers who are in a position to fix the price of their own product for a period or season of production are also enabled to exercise control of all prices to the final consumer. Most of them fix the retail price and allow trade discounts to wholesalers or retailers. Some industries sell their products direct to consumers and others to retailers and eliminate intermediaries. But through whatever channels the products are sold, it is now becoming part of producers' price policy to maintain the prices they have fixed by supplying only those intermediaries standing between them and the consumer, who are willing to enter into a formal agreement to comply strictly with the system of prices fixed by the producers. Sanctions are devised to enforce the agreements against any defaulting intermediary. The usual course is for the producer to refuse supplies, and to take similar action in respect of any other trader who supplies the defaulter. Trade Associations support their producer members by refusing membership to any traders on a 'stop' or 'black' list, so that the defaulter is prevented from trading in any of the products of a large number of firms.

One of the most important price maintenance systems is in operation in the tobacco industry. All prices, wholesale and retail, are fixed by the producer and made the subject of written agreements. A bonus on turnover is paid to the retailer in respect of each financial year during which the agreement has been observed. If the retailer breaks the agreement, not only does he lose the accrued or accruing loyalty bonus, which is a substantial proportion of his profit margin, but supplies may be stopped by the producers and no other traders may supply him; if they do provide him with supplies they also will lose their bonus and supplies may be refused to them. There are similar

¹ Cf. Grether, *Retail Price Maintenance in Great Britain* (Univ. of California Press, 1935).

agreements in other industries, and sanctions are used by producers to enforce them.

Conclusion. The replies to the questionnaire¹ indicate that 32 of the 50 firms fix all prices to wholesaler, retailer, and consumer. Of these 32 firms, 19 bind the wholesaler and retailer by agreement, and the other 13 firms have a tacit understanding that prices agreed upon will be maintained. The evidence seems to suggest that if wholesalers and retailers had some influence over price in the past, it is diminishing rapidly, and they now play only a passive part in the price-fixing process in respect of the products of many industries. For all industries where price-leadership is in evidence it will be sufficient to examine the producer's price policy to determine the selling price of the product to the consumer. If any important part may be ascribed to wholesalers or retailers it will be found generally to apply only in those industries where the producers' selling prices are determined quasi-automatically.

As the main part of the present inquiry is concerned with price-fixing by dominant firms who have full control of selling price of their product at all stages, it was not deemed necessary to discuss the position of wholesalers and retailers in earlier chapters.

¹ See App. III, Qq. 16-17.

QUESTIONNAIRE ON COSTING AND PRICES IN BRITISH INDUSTRY

GENERAL

- A. Yes 29 No 21

- | | | | | | |
|------------|----|------------|---|----------|----|
| A. 1 month | 3 | 3 months | 5 | no reply | 25 |
| 2 months | 12 | 4-9 months | 5 | | |

- | | | | | | |
|-------------|---|------------|----|-----------|----|
| A. No delay | 2 | 3-4 months | 14 | 18 months | 1 |
| 1 month | 5 | 6-9 months | 6 | no reply | 16 |
| 2 months | 6 | | | | |

- A. (a) 14 (b) 24 (a) with (b) 12**

- | | | | |
|-----------|--------|------------------------|----------------|
| <i>A.</i> | (a) 2 | (a) with (b) 3 | (b) with (c) 1 |
| | (b) 5 | (a) with (b) and (c) 3 | no reply 2 |
| | (c) 34 | | |

- | | | | | | | |
|-----------|---------------|---|-------------------|----|----------|---|
| <i>A.</i> | 2 competitors | 1 | 12-20 competitors | 13 | over 175 | 4 |
| | 3-5 | 5 | 25-50 | 7 | large | 1 |
| | 6-10 | 9 | 75-100 | 3 | no reply | 7 |

9. Form and extent of competition: (a) price, (b) quality, (c) style, (d) advertising programmes, (e) premium bonus or gift schemes, (f) other forms. *A. Extent: Keen.*

<i>A.</i> (a) only	15	other forms including (a)	6
(a) with (b)	7	(b) and (c)	4
(a), (b), and (c)	7	others	3
(a), (b), (c), and (d)	7	no reply	1

OUTPUT

10. Do you make up a budget or output plan for a period or season of production?

<i>A.</i> Yes	26	No	24
---------------	----	----	----

11. For estimates of cost (or budget plan) and spreading of 'overhead' costs, do you (a) assume that full maximum output will be achieved, (b) that a 'normal' or 'standard' output is possible, (c) that output will be the same as last year, or (d) make a special forecast each year of what output is likely to be?

<i>A.</i> (a) 6	(b) 21	(c) 10	(d) 12	no reply 1
-----------------	--------	--------	--------	------------

12. If a normal or 'standard' output is assumed what percentage of the full maximum capacity is this normal output?

<i>A.</i> under 75%	7	80-85%	3	no reply 17
75-80%	12	90% and over	11	

13. Is there a minimum output below which it would not be profitable to continue production with the same type (not amount) of specialized equipment you normally use?

<i>A.</i> Below normal	5-10%	3	30-40%	4
	20-25%	7		
Below maximum	20-25%	2	50%	8
	30-40%	3		
	no reply	23		

14. Do you keep some reserve plant to ensure continuity of normal production without pressure?

<i>A.</i> nil	21	10-25%	14	no reply 9
5%	3	33½ and over	3	

PRICE-FIXING

15. Is there a 'charm' price favoured by consumers?

<i>A.</i> Yes	16	No	34
---------------	----	----	----

16. Do you fix the prices of your product to (a) wholesaler, and/or (b) retailer, and/or (c) consumer?

A. (a) 8 (a), (b), and (c) 32
(a) with (b) 4 nil 6

17. If final consumers' prices are fixed by you, do you bind wholesaler and retailer by agreement?

A. Yes 19 No 13

18. When do you fix your prices, (a) before production is commenced, or (b) after the goods are made and ready for sale?

A. (a) 47 (b) 1 doubtful 2

19. On what basis do you fix your prices: (a) on a system of 'standard' costing or budgetary control; (b) on an estimate of what cost is likely to be, based on previous experience or figures from accounts; (c) on a formula; (d) on actual costs, calculated after goods to that order are completed; (e) find 'market' price for a similar product and fix your own price, (i) at that figure, (ii) —% above it, or (iii) —% below it; (f) any other method?

A. (a) 12 (d) 1 (e) (ii) 1
(b) 24 (e) (i) 7 (e) (iii) 4
(c) 1

20. Do you fix your price (a) to cover a definite period within which customers will expect you not to alter it, (b) so that it can be changed on giving notice, or (c) so that it can be changed at any time without notice?

A. (a) 18 (c) 14
(b) 10 not applicable 8

N.B.—All under (b) and (c) usually keep price fixed for 6 months or more.

CHANGES

21. If selling price is fixed for a period are you able to avoid (a) changes in costs of raw material (by entering into forward contracts), and/or (b) changes in wages rates (by agreements) for the same length of period as prices are fixed?

A. (a) and (b) 5 Yes (a) 26 Yes
(a) and (b) 9 No no reply 10

22. If you are not able to avoid above changes, how do you deal with unforeseen increases in cost of raw material and wages: (a) bear out of profits, (b) reduce cost in some way, or (c) alter price?

<i>A.</i> Wages	(a) 27	(c) 12
	(b) 3	no reply 3

23. If costs of raw material or wages decrease, do you (a) add saving thereon to profits, (b) improve product (e.g. put more or better material into it), or (c) reduce selling price?

<i>A.</i> (a) only	11	(a) with (b) and (c)	4	(c)	19
(a) with (b)	4	(b)	2	no reply	5
(a) with (c)	2	(b) with (c)	3		

24. If changes in prices appear to you necessary (for any reason) at any time, do you (a) make the change and ignore the possible reactions of other competing firms in the industry, (b) await information of what one particular firm is doing, (c) await general information about the actions of several other firms, or (d) await and follow market reports?

<i>A.</i> (a)	22	(b)	4	(c)	21	(d)	3
---------------	----	-----	---	-----	----	-----	---

25. Do you find resistance to price changes from (a) wholesaler, and/or (b) retailer, and/or (c) consumers?

<i>A.</i> Increases	(a), (b), and (c)	5	(b) with (c)	2
	(a) with (b)	4	(c)	7
	(a)	7	nil	16
	(b)	4	no reply	5
Decreases	(a), (b), and (c)	1	(b) with (c)	1
	(a) with (b)	4	(c)	2
	(a)	2	nil	—
	(b)	2	no reply	38

26. Have you ever continued your old prices when competitors have changed theirs? If so, what was the effect on sales, (a) when your price was lower than competitors, (b) when your price was higher than competitors?

27. Have your competitors ever continued their old prices when you have changed yours? If so, what was the effect on your sales, (a) when your price was higher than competitors, (b) when your price was lower than competitors?

28. Assuming that competitors do not alter their prices, can you make an estimate of the change you would expect in sales, (a) if price was reduced $2\frac{1}{2}$ per cent, 5 per cent, or 10 per cent; (b) if price was increased $2\frac{1}{2}$ per cent, 5 per cent, or 10 per cent?

Costs

29. Would you consider altering your prices if changes occurred (a) in costs affecting you only (internal—e.g. processing operations or efficiency of plant), and (b) in costs affecting all firms in the industry more or less alike (e.g. basic rates of wages, raw material).

A. (a) Yes 17 No 9 (b) Yes 24 No 9

This question must be read with Q 21. Obviously the replies are not intended to indicate that prices would actually be changed in spite of quasi-contractual arrangements with customers.

30. What length of time would elapse between observed alterations in costs and the change in your prices?

A. less than 1 month 6 3 months 7
 1 month 9 6 months 7
 2 months 4 no reply 17

31. If your price is fixed for a season or you usually avoid changing your prices, do you find that your costs are (a) capable of adjustment when required to meet emergencies when actual costs are differing from 'standard' or estimated costs, (b) incapable of any but minor adjustments?

A. (a) 11 (b) 26 no reply 13

32. If capable of adjustment, do you effect this by all or any of these methods, (a) omitting some unnecessary process or operation, (b) subdividing some processes, (c) speeding up machinery or operators, (d) omitting part of or reducing quantity of raw material content, (e) tightening control to reduce waste of raw material, (f) altering wages or efficiency bonus, (g) designing new and faster machinery, (h) any other method.

33. If you wished to produce a little extra output (say 5 per cent above 'normal') what extra cost per unit of product would you have to incur? (a) direct labour and material only, (b) extra works or indirect costs also. What proportion of selling price (of any one product) is this extra cost?

A. (a) 32 (b) 2 no reply 16

34. If demand increases sharply or you have an unusual quantity of unfilled orders, would you increase selling prices if (a) costs were unaltered by reason of expansion in output, (b) costs decrease by reason of expansion in output, (c) costs increase by reason of expansion in output?

A. No change for (a), (b), and (c) 29 Change for (a), (b), and (c) 6
 No change for (a) and (b) 15 Change for (c) 15

Purchases

35. For what percentage of the (a) raw materials, (b) semi-manufactured goods do you make contracts at fixed prices to run for a period

A.	%	(a)	(b)	%	(a)	(b)
		7		75-89	8	8
under 40		8	8	90 and over	14	16
50-74		7	5			
Fixed contracts but amount not specified, (a) 6 (b) 6						

36. (i) What is the average or usual length of period over which contracts are intended to run? (ii) Do these contracts (a) entirely avoid your being faced with increases of cost, (b) contain a 'break' clause which enables your suppliers to charge higher prices to you if their costs increase?

A. (i)	12 months and over	17	2 months	3
	6 months and over	16	inapplicable	7
	3-6 months	7		
(ii) (a)	34	(b) 9		

Wages

37. (i) How are the wages of operatives fixed, by (a) agreement with Trade Unions or (b) separate bargaining?

A. (a)	34	(a) with (b)	3
(b)	12	no reply	1

37. (ii) In either case are you able to avoid changes in wages rates during a period or full season of production?

A.	1 firm gave yes for	3 months	1 firm gave yes for	24 months
	5 firms „ „ „	6 „	39 firms gave no	
	2 „ „ „ „	12 „	2 firms sent no reply	

38. How are operatives' wages calculated in respect of the greater part of your output? (a) time rates, (b) 'straight' piece work, (c) efficiency bonus system, (d) a special system.

PLANT

39. What proportion of the value of your plant and equipment is, (a) land and buildings, (b) fixed to the premises (e.g. conveyor systems, fixed bases of heavy machinery), (c) partly changeable (e.g. removable 'heads' which can be taken from 'stocks' or 'base' and redesigned)—often called short period plant, (d) loose tools wearing out quickly, (e) patterns, jigs, dies, &c.?

Firms using short period plant

<i>% of total value</i>	<i>Firms</i>	<i>% of total value</i>	<i>Firms</i>
nil	18	33-50	2
under 10	5	50 and over	4
10-20	9	unspecified	16

40. What method do you adopt for providing for wear and tear and depreciation: (a) appropriation from profit of a varying sum each year dependent on amount of profit available; (b) a fixed percentage on diminishing balance; (c) a fixed percentage on the original capital cost; (d) annuity system; (e) annual revaluation; (f) any other method?

A. Fixed plant

(a)	6	(d)	nil	(f)	nil
(b)	23	(e)	1	no reply	5
(c)	15				

Short period plant

(a)	4	(d)	nil	(f)	nil
(b)	15	(e)	1	no reply	18
(c)	12				

41. Do you scrap machinery before it is worn out, (a) to keep cost conditions level with your competitors, (b) to provide new types of products to meet changes in consumers' tastes, or (c) any other reason?

A. (a) with (b)	12	(b)	7
(a)	10	no reply	21

42. How does obsolescence written-off during the five years 1935 to 1939 compare with the amount for 1930 to 1934?

43. How has the technique of production altered since 1913? (e.g. alterations in design and speed of machinery, specialization, and subdivision of processes).

A. 1929-39

Rapid changes	16	Little change	14
Slow changes	14	No reply	6

44. By what percentage could you increase 'normal' output by adding extra machines where possible but without extending your factory buildings?

A. 0%	9	20-25	7	50-75	2	200	1
10-15	7	33-40	5	100	2	no reply	17

45. If you decide to extend the factory what extra output would the smallest practical extension provide?

A.	5%	2	33½	1	200	1
	10-15	5	50	4	no reply	26
	20-25	11				

DEMAND

46. In normal times are your sales, (a) fairly constant, (b) steadily increasing, (c) rapidly increasing, or (d) decreasing?

A.	(a)	21	(c)	1	fluctuating	2
	(b)	23	(d)	2	fluctuating violently	1

47. (i) Can you form a reliable estimate of the demand for your product?

A.	Yes	23	no	10	no reply	17
----	-----	----	----	----	----------	----

47. (ii) Do you collect and utilize information about demand by (a) field service organization, (b) agents' or travellers' reports, (c) wholesalers' or retailers' reports, (d) technical and trade journals?

A.	(a)	3	(b) and (c)	41	no reply	6
----	-----	---	-------------	----	----------	---

PROFITS

48. Do you provide in your price-fixing for (a) the same percentage of gross profit on each line, or (b) different percentages on different lines? If different percentages, upon what considerations do you make the distinction?

A.	(a)	14	(b)	34	no reply	2
----	-----	----	-----	----	----------	---

49. Are there any conventional or accepted ideas amongst firms in the industry, about the rate or amount of annual profits?

A.	10% on cost	1	7½% nett profit	1
	5% nett profit	1	no	47

50. In deciding the amount of profits to distribute what considerations do you take into account? (a) the rate of dividend shareholders are expecting, (b) if a public company, the current market forecasts of your dividend, (c) the finance required for expansion of your business, (d) any other.

A.	(a)	2	(c)	28
	(a) with (c)	7	no reply	13

51. If your profits increase above the average of previous years, what proportion of the increase do you (a) distribute in increased dividends, (b) place to reserve?

A. (a) 75% or over	4	(b) 75% or over	19
		50% or over	6
		33½%	1
		no reply	20

52. If your profits decrease compared with average of previous years, do you (a) maintain dividends and draw on reserve, or (b) reduce dividends?

A. (a) 4	(b) 29	(a) with (b) 4	no reply 13
----------	--------	----------------	-------------

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